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Railway & Commercial Gazette

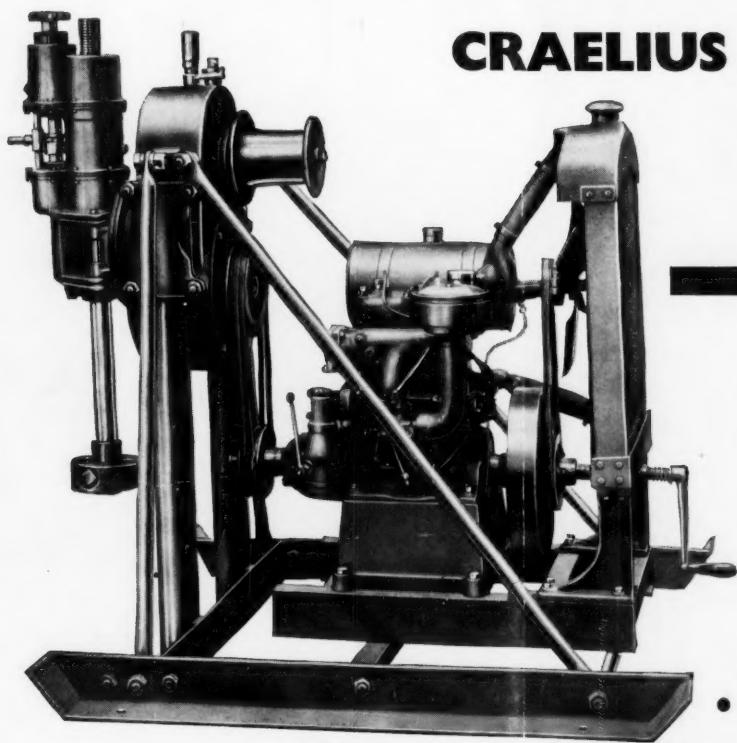
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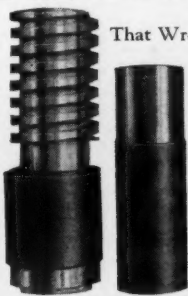
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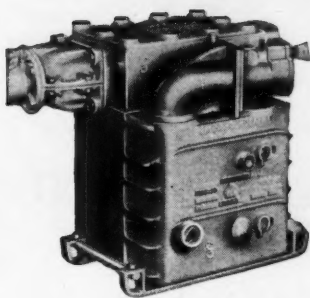
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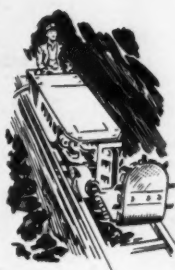
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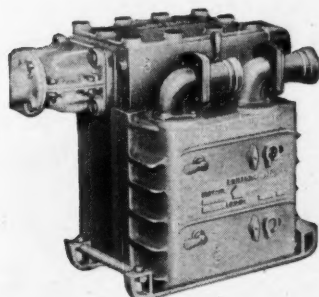
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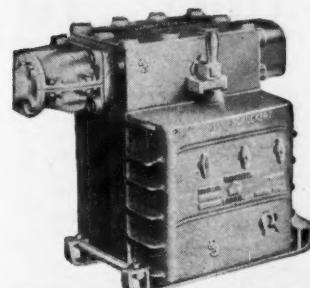


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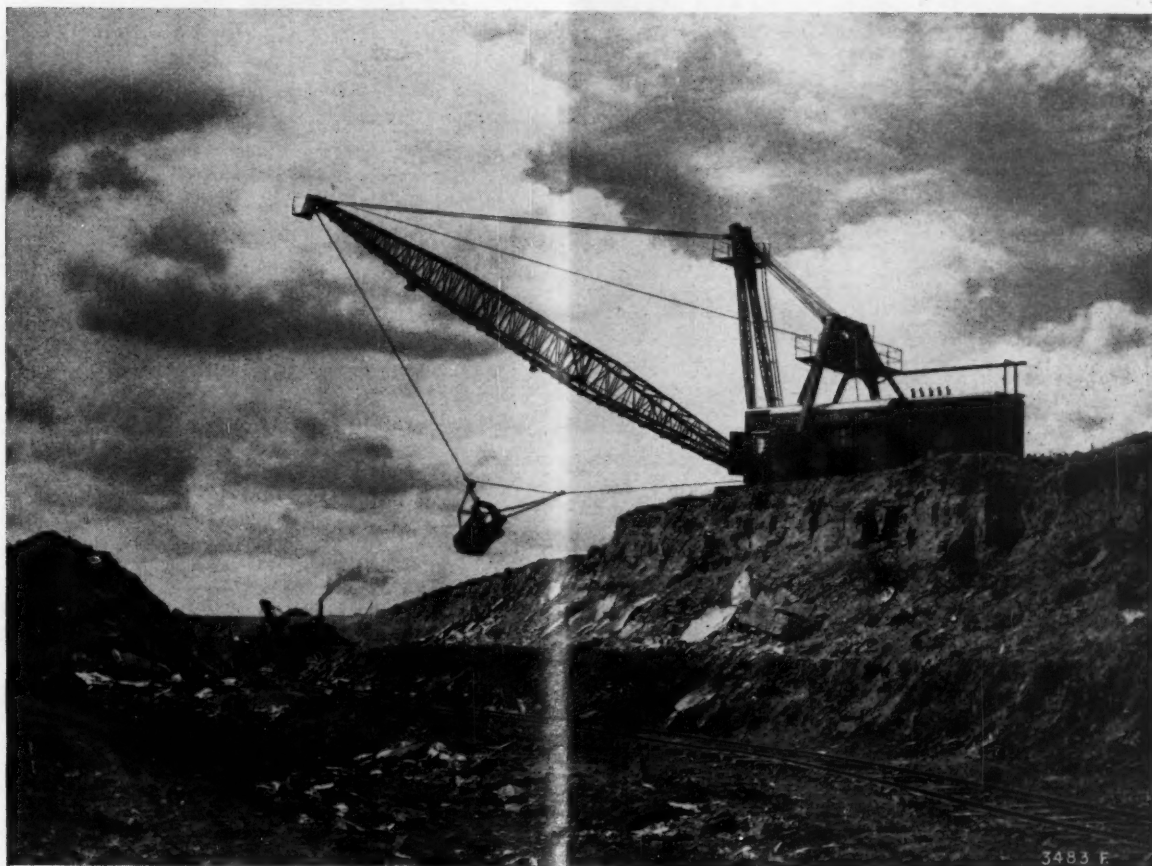
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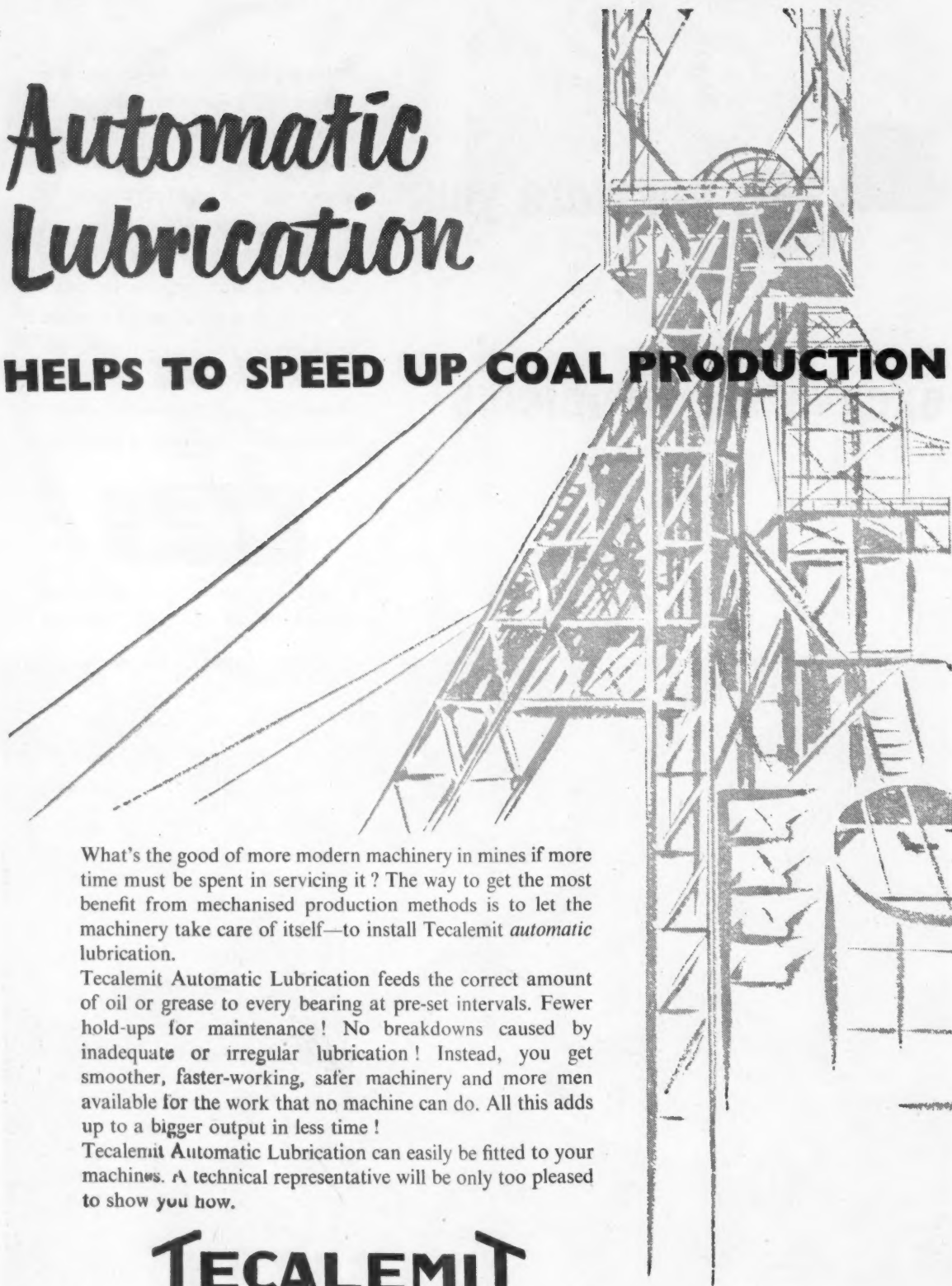
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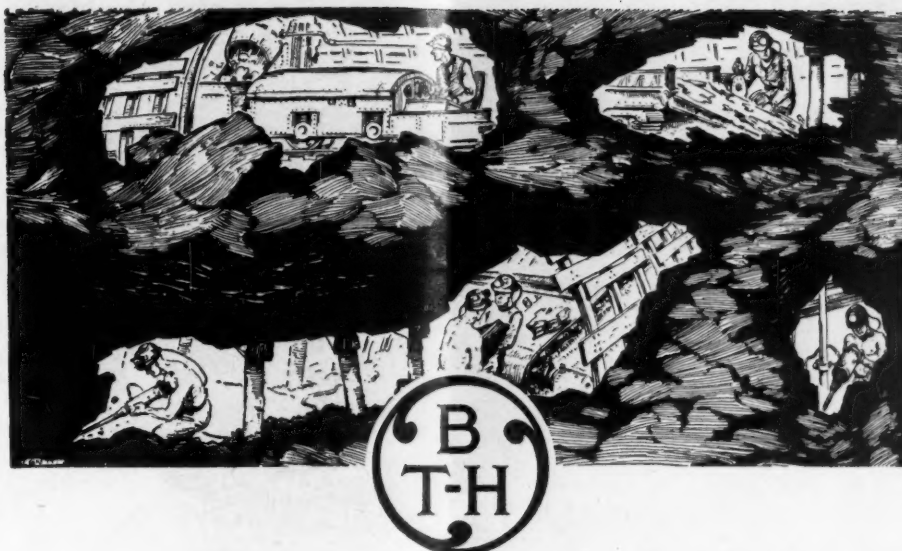
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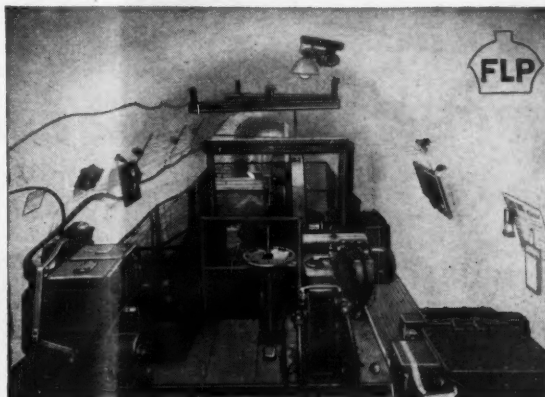


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The Mining Journal

Established 1835

Vol. CCXLII No. 6179

LONDON, JANUARY 22, 1954

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NOTES AND COMMENTS

Sydney's Guarded Communique

Indefinite and inconclusive as the communiqué issued after the Sydney conference undoubtedly was, it yet contained evidence that the Finance Minister's journeys had been worthwhile. If the success of the conference was due primarily to the favourable economic atmosphere in which it took place, the Finance Ministers may take some credit for creating that climate.

The conference that followed the accession to power of the present Government was one of crisis, and crisis is a good incentive for making decisions. Later discussions were disappointing partly because they took place in the troubled area lying between the storm and the calm seas, and partly because reviewing in retrospect the efficacy of past decisions involves an investigation of domestic policy which some members resented and also casts doubt on the efficiency of the Commonwealth's consultation machinery.

At Sydney, the Ministers were not only able to look to the future again but were concerned with those problems of development of resources and trade which are particularly suitable for discussion under their peculiar constitution. The disagreement on the value of imperial preferences was kept under control and although the idea of the sterling area as "a closed system of discriminatory arrangements" is rejected, further discussions are envisaged before G.A.T.T. is reviewed.

Convertibility remains an important objective but the detailed advance towards it could scarcely be planned before the publication of the Randall report which is now believed to be imminent. Trade is to be developed so as to enhance the overall balance of payments position of the sterling area and not merely to save or earn dollars, which the resources of the Commonwealth are to be exploited seemingly without fear of any serious American recession.

To assist the development of resources—not least, let us hope the Commonwealth's markets—the London money market will be more readily available to sterling area countries. About £120,000,000 was authorized for transfer to the sterling area in 1953 (discounting transfer by United Kingdom residents) but it was clear that their had been disagreements on what constituted "desirable" development and some difficulty on the part of sterling area borrowers in framing their applications to meet the rules both of the British Treasury and of the World Bank. It is always a source of irritation to have unused funds along-

side a surfeit of "undesirable" application but, now that the conditions for applications have been relaxed, the probable excess of demand over supply for development capital will help to create a system of commonly accepted priorities.

The exploitation of Australian uranium is so shrouded in "security" that it was not to be expected that it would figure prominently in the final communiqué, and if pre-conference speeches had led to hopes of a statement, they also threw light on the clash of interests on this mineral. On first arriving in Australia Mr. Butler was reported to have described Britain as "hugely interested" in Australia's uranium and oil resources and was said to have added that they would have to be used for the benefit of the British Commonwealth. Later, at a luncheon in Sydney, Mr. Butler modified this extremely forthright statement when he said that Australia's resources of oil and uranium were hers to dispose of as she wished but that inevitably they would benefit the free world. A little more tact from Mr. Butler and a little less sensitivity in Australia will be required if uranium is to be exploited successfully.

A rather more curious omission was the absence of comment on commodity stabilization schemes. Once again it was Mr. Butler who, in speaking to rubber and tin producers, on his way to Australia, said that the problems facing their industries would be considered at Sydney. In this case, too, especially in advance of the Randall report, it may be unreasonable to have expected any comment on, for example, the draft scheme for tin, but it must surely have been discussed at some length.

Silver in 1953

The unusually close balance maintained between the forces of supply and demand in the world's silver markets during 1953 accounted for the metal's unusual price stability. Messrs. Handy and Harman stated in their annual review of the silver market.

During 1953 the spread between the high and low New York silver price was only 2 c. and not unnaturally the London price, which is based on the New York price, converted to British currency with a reasonable allowance for shipment charges from London to New York, showed the same steadiness, the low for the year being 72½d. and the high 74d. In fact, the review states that not since World War II, when the silver price was subject to Government controls, has such unusual stability been experienced.

The stability of the silver market was ascribed chiefly to the market policies followed by the Bank of Mexico which continued to buy and sell silver in such a manner as to ensure market stability. In general, the review states, the Bank of Mexico bought Mexico's own silver production at the New York rate, when producers were unable to find buyers in the regular market, and sold silver out of stocks when trade demand was strong. It is probable, the review says, that the Bank of Mexico will continue to follow this long established policy of buying and selling silver to stabilize the price, so that the same general stability in the price of silver can be expected in 1954.

However, Messrs. Handy and Harman warn that any estimate of the future price of silver is subject to "the uncertainties of Congressional action on pending legislation." It is pointed out that there are two Bills relating to silver pending before the Senate Banking Committee. One Bill was introduced last July by Senator McCarran, providing in effect for a bi-metallic monetary standard based on substantially higher statutory prices for gold and silver. The other Bill, introduced in August of last year by Senator Bush, provides for the repeal of existing silver purchase laws.

Of particular interest to the world silver industry is the position concerning Lend-Lease silver. Unfortunately the review has no new developments to report beyond stating that no repayments of United States Lend-Lease silver were made in 1953. Thus the amount outstanding at the end of 1953 remained at 410,500,000 oz. Most of this silver is due to be repaid in April, 1957, and the manner in which the U.S. Treasury deals with the repayments could affect considerably the world silver market.

Referring to supplies of foreign silver the review states that consumers will probably be more dependent on new mine production during 1954 than in the past. Cuban coins, which have provided a substantial addition to supplies since 1950, would no longer be available and outside of the free stocks of silver held by the U.S. Treasury, there are no indications that other sources of comparable importance will develop. Moreover, the free stocks of silver held by the U.S. Treasury have been declining rapidly in recent years, largely due to subsidiary coinage requirements, and at the end of 1953 the total stood at only 50,400,000 oz., a decline of 28,700,000 oz. At this rate these supplies would be exhausted in less than two years. At the end of 1949 stocks stood around 170,000,000 oz.

Referring to imports and exports the review states that the most significant transaction of the year was the sale in London of about 21,500,000 oz. of Russian silver, most of which it is believed was taken up by the Bank of England for its own stock.

The U.S. consumption of silver in 1953 was estimated at 105,000,000 oz., an increase of 10½ per cent over 1952. The feature of the consumption figure was that the proportion of silver used in the U.S. for industrial purposes, as distinct from the arts, continued to rise in 1953 and the review declares there is every indication that this trend will become increasingly evident in the future.

The Atomic Industry in the U.K.

The industry which produces atomic energy in the United Kingdom is now worth many millions of pounds, and the story of its growth is told in a booklet, *Britain's Atomic Factories* (5s.), released this week by the Stationery Office. The atomic energy programme began in 1946, and has developed in seven years until large quantities of uranium 235 and plutonium are being produced in three factories situated at Springfields, Lancashire, Windscales, Cumberland, and Copenhurst, Cheshire. Headquarters of the

Atomic Energy Production Industry is at Risley, in Lancashire.

Following a preface by the Rt. Hon. Duncan Sandys, P.C., M.P., Minister of Supply, the volume tells of the atomic production division and its programme, the factories at Springfields, Windscale, and Copenhurst, in chapters embracing the production story enacted during the stewardship of the Ministry of Supply. The organization of Risley and health protective measures enforced in the factories end a revealing book.

It is suggested in the final chapters that, if certain assumptions are realized, it may at some future date be possible to replace coal by nuclear fuel for the generation of electrical power in the United Kingdom. Yet many years must elapse before this goal—even if it be feasible—is realized.

A more immediate objective, on the other hand, might be the establishment of a reactor system which, in 20 years' time, might generate enough electricity to save 20,000,000 tons of coal per annum. From that point the development of breeder reactors might be of sufficient efficiency to achieve the ultimate of the generation of all the United Kingdom's electricity. And yet, despite the possibilities of development in stages, the book emphasizes that atomic development is not a programme, for there is as yet too much which must be only assumed and has yet to be proved by experiment.

Nevertheless, the Bill to establish an Atomic Energy Corporation is now being drafted, and it seems probable that this is one of the legislative measures to which the Government will give priority in the next stage of the Parliamentary session.

The Preservation of Cornish Engines

The Cornish Engines Preservation Society was formed in 1935 to preserve a small, representative selection of engines which were used in the days of Cornish mining prosperity and which are to-day in danger of being dismantled. The principal engineering institutions of the United Kingdom, namely the Institution of Civil Engineers, the Institution of Mechanical Engineers, the Institution of Electrical Engineers, and the Institution of Mining and Metallurgy have appointed trustees for an endowment fund which the Society hopes to create with the help of engineering, mining and oil companies together with any other interested bodies. Barclays Bank Ltd. have consented to act as treasurers, and the fund will be used at the discretion of the trustees both as to principal and interest.

Among the principles established for the operation of the fund is that monthly statements will be received by the trustees, day to day expenditure and minor repairs and renewals will be carried by the ordinary funds of the Society, and no request for a grant from the endowment fund is to be made from the Society to the trustees unless the work entailed exceeds £100 in value. When a request becomes necessary, a report on the work involved will be submitted to each of the trustees by a competent architect or engineer, accompanied by an estimate of the cost. Finally, the trustees shall decide whether the work is to be put in hand. At the conclusion of any work undertaken and after a clearance certificate has been received, the treasurers will obtain the authority of the trustees to pay the account.

The Society has recently published a third edition of its pamphlet *Cornish Pumping Engines and Rotative Beam Engines*, which shows what progress has already been made towards fulfilling the objects of the Society. This slim volume, at 5s. to members and 15s. to non-members, gives a description of the Cornish steam cycle, and discusses in turn those engines which have been acquired by the Society to form part of the proposed Trevithick Site Museum.

South Africa

(From Our Own Correspondent)

Johannesburg, January 15.

Looking back over the past year progress in the Orange Free State fields has been excellent. The number of producing mines is now five and over the coming 12 months at least three, if not four, properties will be added to the list.

The first of these will be Anglo American's President Steyn in the Welkom area. The reduction plant has been running for metallurgical and test purposes and further large scale extensions to the plant are in progress. President Brand is nearing the production stage, although it is not expected that the first gold will be poured before the second half of the year.

The other two near-producers are in the Sand River area. Harmony is expected to pour its first gold by about June and Virginia is reported to be only about three months behind its neighbour in development. Free State Geduld, it is thought by the men on the spot, could be in production before the end of 1954 provided that no further setbacks from water trouble are encountered.

THE SAAIPLAAS AREA

By the beginning of 1955, therefore, there should be only three more mines still in the developing stage, Merriespruit, Loraine and Jeanette. It is also possible that a start may be made with the opening up of the Saaiplaas area, which lies immediately to the north of Harmony. All the indications are that this will prove to be another rich area, but the controlling factor is, of course, the availability of adequate capital and labour resources—problems unfortunately still ever present.

In addition to the Saaiplaas area, there is the Dankbaarheid-Erfdeel district, which was so much in the popular press some years ago. The area is cut off geologically from the Welkom area by a major fault. Without attempting to indulge in any rash prophecies as to what the exact mineralization there may prove to be, it nevertheless is true that an important factor in the opening up of the ground would be that, since the original drilling programme was undertaken, power and water supplies, roads, railways, and other amenities have so developed in the Free State that the speed of opening up any new mine, as well as the cost, should be favourably affected.

So far as can be ascertained there is no major geological disturbance existing between the Saaiplaas and Harmony-Virginia Dankbaarheid-Erfdeel areas. Apart from the overall pattern of the Basal Reef horizon as a gold producer which possibly prevails, the question of uranium content has become of importance subsequent to the original exploratory work. It has now been announced that permission was granted by the Minister of Mines to conduct preliminary investigations into the presence of uranium on Dankbaarheid and Erfdeel. Tests carried out so far have proved to be of sufficient interest to justify the reopening and deflection of certain of the old boreholes. In addition, at a later date when funds become available, it is proposed to sink fresh boreholes primarily to obtain further knowledge of the uranium occurrences.

These deflections and new holes, in due course, will supply information on the gold content of the reefs and provide a check against the original findings which, in the light of past events.

What will eventually emerge from this work is problematical, but it does contain the possibility that at some time in the future a further extension of the Free State goldfields may come into being.

From the beginning of December until the middle of

January when the first of the quarterly progress returns are made, there is traditionally little of note doing in the mining world in South Africa. Many are on holiday, the company meeting season is over, the pre- and after-effects of the festive season have full play. The Rand, following the traditions of the early days, takes both Christmas and New Year seriously. From the point of view of hard-headed economics this could possibly be deplored but from the human side this survival has its merits.

MINING RECORDS

Some time ago, the Chamber of Mines compiled a brochure giving a number of interesting statistics concerning the gold mining industry. Since the publication, however, progress has put several of the figures out of date. In the last week of the year the Chamber's statisticians brought these figures up to date.

The deepest gold mine on the Rand is the famous Crown Mines now operating at 1½ miles below the surface with its deepest working place 9,714 ft. down. The deepest levels of the next three mines are: Robinson Deep 9,125 ft., City Deep 8,947 ft., and E.R.P.M. 9,416 ft. Since the discovery of the Witwatersrand to the end of 1953—a period of 67 years—gold valued at £3,280,000,000 has been recovered, involving some 525,000,000 oz. The three largest mines are still Randfontein Estates, Crown Mines, and Government Areas. The three producing the most gold are Blyvooruitzicht, Daggafontein, and Crown Mines.

There are now 49 major producers listed by the Chamber of Mines, of which five are in the Orange Free State, and among them they are producing 45 per cent of the world's gold, with Canada in second place with 17 per cent.

Here are a few more statistics about the industry. The deepest single hoist shaft is No. 3 at Vogelstruisbult G.M. of 6,662 ft. The tallest headgear is that at the South Deep, Simmer and Jack at 190 ft. The deepest borehole sunk is U.D. 2 of Western Ultra Deep Levels in the Potchefstroom district, 10,738 ft. The largest ventilation fan is at Springs Mines with a capacity of 1,130,000 cu. ft. per min., and size 30½ ft. in diameter. Largest air-cooling plants are at Crown Mines and E.R.P.M. with capacities of 450,000 cu. ft. per min., cooling air from 62 degrees to 38 degrees F., equivalent to melting 2,400 tons of ice a day.

Shaft-sinking record: Vlakfontein G.M. No. 2 shaft, 585 ft. (May, 1953); Virginia (O.F.S.) No. 3 shaft, circular, 504 ft. (April, 1951); Loraine (O.F.S.) rectangular, No. 1 shaft, 342 ft. (November, 1951).

Portugal

(From Our Own Correspondent)

Oporto, January 14.

The chief matter of interest at the moment is the recently published alteration of the export tax on Wo₃ and Wo₃/Sn residues not exceeding 25 per cent Wo₃ content. As matters now stand, export of these residues is almost duty free if the price does not exceed Esc. 10.0 per kilo f.o.b. If this price is exceeded, however, Esc. 10.0 is deducted from the price and the result multiplied by 0.45. This measure has been long overdue and will allow for the export of material that is of little use to Portugal while simultaneously finding a useful output to consuming countries. Export figures, compared with a similar period last year, are 883 tonnes down as regards wolfram and 388 tonnes as regards cassiterite.

Production figures for October are as follows (in tonnes): wolfram 367, cassiterite 77, cupreous pyrites 53.389.

Export figures for November are as follows (in tonnes): wolfram 296, cupreous pyrites 26.893, iron ore 5.789, white arsenic 176. Exports of tin metal amounted to 7.78 kilos.

Western United States

(From Our Own Correspondent)

Portland, Oregon, December 29.

Homestake Mining Co., largest and deepest gold mine in the United States, is deepening its main entry, the Yates shaft, from the 4250 level to the 5000 level. Future plans call for development below the 5000. Recent production has averaged 3,900 tons per day with mill improvement under way to increase this. During 1952 average value of the ore was \$13.54 per ton. Summit King Mines Ltd., in its joint enterprise with Homestake, has proved a four foot vein averaging \$50 per ton on the 550 ft. level of its project north of Tonopah, Nevada. This development has been under way for several years, frequently under discouraging circumstances, the object being to locate the northerly extension of the ore zone that proved so productive at Tonopah. After thorough geological study a diamond drilling campaign was carried on with results that indicated that systematic underground development was justified.

Open cut gold mines are not of common occurrence but one has been put on production in Siskiyou County, California, where the Siskon has started production at the rate of 100 tons daily and is enlarging its mill to treat 250 tons. Ore occurs in a wide shear zone on a contact between greenstone and phyllite, is excavated by power shovels and treated by cyanidation. The first 45 days of the mill's operation showed average assay value of heads of \$23 per ton with 90 per cent extraction. Heretofore the most notable open cut gold mine in the United States was the Wasp No. 2, a neighbour of the Homestake in the Black Hills of South Dakota where a flat stratum of mineralized quartzite was mined by steam shovel and cyanided. This mine has not operated for several years.

THE COPPER INDUSTRY

In November Anaconda commenced production from its Yerington, Nevada, project which has been under intensive preparation for the past two years. Operation is on a large body of oxidized ore beneath which is a sulphide body, the extent of which is still undetermined. Excavation is by electric shovel and treatment by sulphuric acid leaching. The company has its own sulphur deposit about 50 miles distant and makes its own acid. The leaching plant has a daily capacity of 11,000 tons of ore and output of cement copper over the next ten years will exceed 300,000 tons.

Stripping of Kennecott's Veteran ore body in the Ely, Nevada district is well under way, the first contract calling for removal of 4,000,000 tons of the 60,000,000 tons of waste and overburden which must be moved in preparing the large ore body for surface mining.

American Smelting and Refining Co. announces that production will commence in February at its Silver Bell unit in Arizona (*Mining Journal*, July 2, 1953). Silver Bell lay idle for 25 years until A.S. and R. realized its possibilities and started development as a large low grade operation. Ultimate daily capacity is to be 7,500 tons.

Sunshine Mining Co. in the Coeur d'Alene district in Idaho has made changes in its treatment process that have made a satisfactory improvement in the product. Much of the Sunshine ore is tetrahedrite and it had been producing a bulk copper-lead-silver concentrate that was high in antimony. With the revised flow sheet two concentrates are made, silver-copper containing most of the antimony and lead-iron practically free of the antimony. The antimony leaching plant which was closed down in 1944 has been reactivated and is producing 45 tons per month of this by-product from treatment of the tetrahedrite concentrate.

Brazil

(From Our Own Correspondent)

Teresopolis, January 9.

Brazil's urgent need to develop mineral resources has emphasized the shortage of mining engineers and geologists. The Sao Paulo Polytechnic School, in launching a campaign to attract students to its mining and metallurgical courses, points out that, of 151 pupils who graduated last year as engineers, only three had specialized in this branch. "Petrobras," the Mixed-Economy Society, recently created to develop Brazil's oil resources, requires 150 specialists immediately and must engage the majority abroad.

In *Engenharia, Mineração e Metalurgia* the Director of the Geology and Mineralogy Division of the D.N.P.M., calls particular attention to the need to create posts for geologists, at present only admitted to the Department under short-term engagements, owing to archaic regulations. More than three-quarters of Brazil's sub-soil, he says, is geologically unknown, preventing scientific planning of research. In the Piaui-Maranhã Basin, until 1946, nothing was known of the Devonian formations, which cover immense areas and are important in the search for oil. Throughout the Amazon Basin knowledge is confined to the lower reaches of the principal affluents, nothing whatever being known of the immense regions of the headwaters. Three-quarters of the highly mineralized State of Goiaz is unknown, the age of vast formations in Bahia has not been defined and the entire crystalline region of the north-east, of proved economic interest, awaits thorough investigation. In the dry lands, embracing parts of five north-eastern States, geologists are urgently needed to locate underground water. Even along the coast and in South Brazil lack of geological knowledge impedes mineral exploitation.

There are probably not more than 50 Brazilian geologists, so that both the D.N.P.M. and the Petroleum Council are obliged to contract specialists abroad. British, American, Swiss and German geologists are working in Brazil under contract, compiling geological maps, seeking sedimentary oil areas and new coal seams and measuring ore reserves. Dr. Avelino de Oliveira, head of the D.N.P.M., is urging the government to recognize the career of geologist, provide training facilities and give candidates proper access to official posts.

IMPORTS OF ANTIMONY

The best known Brazilian deposits of this mineral, of industrial interest, are at Morro do Bule, in the Ouro Preto zone of Minas Geraes, and at Cananeia, in Sao Paulo. Others exist in the Municipality of Guarapuava, Parana. None of these occurrences is exploited and the only antimony produced locally continues to be extracted from the slag of lead, refined by the Plumbum Company.

No consumption figures are available, but the demand is presumably increasing, owing to the post-war growth of industries, such as the manufacture of storage batteries, sheathed telephone and telegraph cables, coloured glass, metal alloys, paints and enamels. Imports amounted to some 200 tons annually during the war, from U.S.A., Mexico and Peru. When hostilities ceased Great Britain became the principal supplier. Imports rose to 392 tons in 1947, but dropped considerably after the licensing system was introduced in 1948. Imports are no real indication of consumption, however, as Brazil also imports antimony in the form of alloys and chemical combinations.

In future Brazil will import antimony from Yugoslavia, valued at U.S. \$50,000, and from Bolivia to the value of U.S. \$100,000 annually.

1953 A Record Year in U.S. Mineral Production

The United States last year broke fresh records in mineral production valued at around \$14,350,000, equivalent to an increase of 7 per cent over 1952. We give below excerpts from a year-end summary of 1953 prepared by the U.S. Bureau of Mines. Although the greatest increases in outputs were recorded in the fuel minerals, we have confined our extracts to the sections of the report dealing with the metals and rare earths. All tonnage figures are in short tons unless otherwise stated.

Copper: Although abandonment of copper price controls in 1953 made substantially more of this metal available to the United States market than in recent years, domestic production of about 926,000 tons merely maintained the level of 1952, with Defense Production Act stimulation delayed for the most part until 1954. The maintenance of an abnormally high price for Chilean metal throughout the year caused proportionately less copper than previously to be brought in from this predominant supplier—44 per cent in January-October, 1953, compared with 58 per cent in the corresponding period of 1952. However, with an over-all price of 28.6 c. a lb. compared with 24.2 c. a lb. in 1952, supplies of copper were more than adequate for expanded requirements in 1953 and the anticipated drop in price did not materialize.

Lead and Zinc: Throughout the year lead was in good supply, with domestic mines producing 340,000 tons of recoverable metal compared with 390,000 tons in 1952. During 1953 secondary smelter output was about 450,000 tons compared with 471,000 in 1952, and imports of 545,000 tons compared with 542,000 tons in 1952.

Although slab zinc consumption in the United States during 1953 reached the all-time high of about 1,000,000 s.tons, domestic mine production was only 540,000 tons, the lowest since 1938, and many mines were closed or operated on a reduced schedule. Imports reached a new high, totalling about 525,000 tons of zinc in ores and concentrates and 230,000 tons of slab zinc; corresponding figures for 1952 were 429,000 and 115,000 tons respectively. Combined primary and secondary supplies in terms of recoverable metal exceeded requirements by about 110,000 tons, allowing considerable build-up of stocks. The average selling price is estimated at 10.9 c. a lb.

Domestic producers of lead and zinc, particularly zinc, through much of the year sought support of their market by tariff, quotas and other means. At least three government committees were studying the situation in 1953 with a view to making recommendations early in 1954.

Based on shipments, this country's self-sufficiency in primary antimony declined to less than 1 per cent as domestic mine production was suspended almost completely because of competition from imports.

Aluminium: Domestic production of bauxite, the principal ore of aluminium, remained virtually unchanged from 1952 at 1,600,000 tons, while imports increased 1,000,000 l.tons to about 4,500,000 tons from 1952 to 1953, as a result of a four-fold increase in receipts from new mining operations of Reynolds Jamaica Mines and Kaiser Bauxite Company in Jamaica. About 95 per cent of domestic production came from Arkansas.

Alumina for aluminium production was made at six plants in the United States. The Bureau of Mines operated a plant at Laramie, Wyoming, to test the feasibility of making alumina from aluminium silicate rocks.

Although no new primary aluminium plants began production during 1953, increased output at existing plants brought the year's total output to 1,250,000 s.tons—far above that of any previous year.

Titanium: Although domestic commercial production of titanium sponge metal in 1953 was double that of 1952—an estimated 2,300 s.tons compared with 1,075—military de-

mand for this metal grew faster. This depleted the government's revolving-fund stockpile. Controls were reimposed on the distribution of titanium products for the civilian market, and interest in constructing plants for converting titanium minerals to metal was stimulated. The rapid development of uses for titanium in military equipment led the Office of Defense Mobilization to announce on August 6, 1953, a revised defence expansion goal calling for an annual output of 25,000 s.tons of titanium sponge-metal, 3,000 tons over that established on October 13, 1952.

Present and anticipated scarcity of titanium metal for defence needs prompted the Defense Materials Procurement Agency on April 30, 1953, to contract with the Bureau of Mines for production of 180 s.tons of titanium over an 18-month period. The metal will be produced at the Bureau's Boulder City, Nevada, pilot plant.

Domestic production of the titanium mineral ilmenite was about 9 per cent lower in 1953 than in 1952. About 20 per cent of total requirements was imported, with India the major supplier. Titanium slag imports from Canada were about triple those of 1952.

Although domestic production of rutile, on which production of titanium metal is now based, was slightly greater in 1953 than in 1952, about two-thirds of the nation's requirements were met by imports from Australia, the sole foreign supplier since 1947.

Iron Ore: The production of iron ore reached a new high in 1953 in spite of a slight relaxation in demand most evident during the second half of the year. Shipments of 117,000,000 l.tons were 20 per cent higher than the 1952 total of 97,236,397 l.tons. Substantial new ore-carrier capacity on the Great-Lakes had an important influence on production and shipments.

Cobalt: Except for cobalt concentrates, domestic production of which declined 10 per cent in 1953, the ferro-alloy metals produced in this country pointed sharply upward. Cobalt imports were up, and consumption of this metal will approximate the 1952 record of 10,818,000 lb.

Chromite: Importation and consumption of chromite was carried on at record rates during the year, and domestic output was almost triple that of 1952. Chromium products (metal and alloys) were consumed at a higher rate than ever before.

Manganese: Domestic production of manganese ore, stimulated by the General Services Administration's domestic purchase programme, increased materially to 160,000 s.tons in 1953. Imports, consumption and stocks continued high throughout the year.

Molybdenum: Production of molybdenum for the year was only slightly below the record output of 1943, and actually exceeded the 1943 rate during the second half of 1953. It appeared from preliminary data that the United States accounted for over 90 per cent of world production.

Tungsten: Domestic production of tungsten exceeded consumption during the year and imports were at an all-time high.

Columbium-tantalum: Increased supplies of columbium-tantalum ores and a decrease in defence demands led to relaxation of government controls on end-uses of these

strategic metals for non-defence purposes. Even though domestic production of columbite-tantalite was many times greater than in 1952, over 99 per cent of the 1953 supply was imported, largely from Nigeria.

Beryllium: Supply exceeded demand during 1953. The new supply of beryllium ore (beryl) was the greatest in history. As the result of resumption of production of master alloys, metal, and compounds by a second primary producer, an ample supply of basic material was available to fabricators and producers of end-use products. Although domestic mine shipments of beryl exceeded those of 1952, they constituted less than 10 per cent of total new supply.

Monazite-Bastnasite: Operations concerning monazite in the Long Valley field of Idaho, discovered by the Bureau of Mines in 1950, continued to be the largest source of the rare earth metals. Work continued on metallurgical problems in the beneficiation of bastnasite, and for the first time since 1950, imports of monazite were received.

Zirconium-Hafnium: Private companies expressed increased interest in the production of metallic zirconium and hafnium. The Bureau of Mines, in order to meet Atomic Energy Commission requirements, continued to produce the major part of the metals. The production of hafnium-free zirconium resulted in ductile hafnium metal being available in more than laboratory quantities for the

first time in history. Hafnium and zirconium have important atomic energy uses.

Fluorspar: Domestic production of fluorspar declined slightly in 1953, but consumption reached an all-time high of nearly 600,000 tons.

Lithium: Production of lithium minerals continued to increase, reaching an all-time high in 1953. Requirements for lithium compounds for such uses as ceramics and all-purpose greases accounted for the increased demand. A larger new lithium chemical plant was completed in Virginia during the year.

Gold: Production of gold in the continental United States was 2 per cent greater in 1953 than in 1952, as increases in output from straight gold mining and by-product production of gold from base metal mines in some areas more than offset declines in others. Silver production was down 2 per cent from 1952, reflecting lower prices for lead and zinc that closed some mines producing these metals with silver as a by-product.

Except for silver, output of the rare and precious metals produced in this country and on which the Bureau of Mines compiles data increased during 1953. They are beryllium, columbium-tantalum, gold, silver, rare earths, and zirconium-hafnium. The bureau does not compile data on domestic uranium production.

Compressed Air Supplies for Mines of the Witwatersrand

By A. G. THOMSON

The compressed air used by Witwatersrand mines is purchased in bulk at a flat rate price. The system is regarded as unique and has contributed considerably towards the maintenance of economical working costs. The following article tells of the development and volume of this supply, and emphasizes the difficulties experienced with pipe corrosion.

For many years the Victoria Falls and Transvaal Power Company provided the Witwatersrand gold mines with cheap and abundant supplies of electricity and compressed air. On the expiration of its franchise its undertaking was expropriated by the non-profit-making national authority, as provided for under the Electricity Act. When Escom assumed ownership and control of this undertaking it acquired a compressed air system which is unique.

To explain how the supply of compressed air in bulk originated, it is necessary to go back to 1906, when the Victoria Falls and Transvaal Power Company was formed for the purpose of supplying electrical energy to the gold mining industry and other consumers in the Witwatersrand district. After contracts for electricity had been entered into with several of the mining groups, the Rand Mines group—now the Central Mining-Rand Mines group—negotiated for the supply of its requirements. The fact that 10 of the 13 mines belonging to the group were situated fairly close to one another in the central area prompted the group to stipulate that compressed air should be supplied in bulk. It was also stipulated that the supply of both electricity and compressed air should be given by a separate company to be formed for the purpose and registered in the Transvaal. This led to the registration of the Rand Mines Power Supply Company Ltd. as a subsidiary of the V.F.P.

In terms of the licence granted to it under legislation, the V.F.P. was not compelled to supply compressed air to any consumer, but subject to certain conditions ensuring priority of supply to mines of the Rand Mines group, supply was also given to several other mines and a few relatively

small industrial consumers, all of them within easy reach of the pipe system. In order that the three mines belonging to the Rand Mines group but not situated in the central area should suffer no disadvantage it was stipulated that these should be supplied by the V.F.P. by means of electrically-driven plant installed at the mines.

It was agreed that the group would pay the company the same price per air unit as that which was then being paid for a unit of electricity, namely 0.525d. The definition of an air unit was such that the payment to the Power Company was approximately the same as it would have been had the mines electrified their compressors and purchased from the Power Company the energy required to drive them. For the purpose of the contract, the air unit took the form of a schedule setting out the weights of air contained in a unit at various delivered pressures. These weights range from about 30 lb. of air (483 cu. ft. of free air) per unit, when the delivered pressure is 80 lb. per sq. in. gauge, to about 25½ lb. (410 cu. ft. of free air) when the pressure is 120 lb. per sq. in. They represent the quantities of air which the various steam-driven compressors originally existing on the mines would, on a weighted average, have delivered at the chosen pressures for the expenditure of 1 kW. hour of steam energy in the steam cylinders of these compressors as shown by indicator drives.

To arrive at these figures it was necessary to ascertain by an extensive series of tests the weighted average efficiency of the existing compressors. It was agreed that the compressors should be tested by sample, and six machines were selected as being representative of the types in use. The tests were carried out jointly by the V.F.P.

and Rand Mines Ltd., and resulted in a weighted average figure of 64.1 per cent. The air unit used for costing purposes may, therefore, be defined as 0.641 of the quantity of air which would, theoretically, be compressed isothermally from the mean annual atmospheric pressure and temperature of the Witwatersrand to a given pressure by the expenditure of 1 kW. hour. One air unit per hour may be taken as approximately equivalent to a compressed air delivery of 7 cu. ft. of free air per min. on the main system and 8.5 cu. ft. of free air per min. on a separate air system at Brakpan.

The capacity of the plant installed initially by the V.F.P. for feeding its air-pipe system was 36,000 kW. (48,000 h.p.), consisting of 12 3,000 kW. (4,000 h.p.) units of the rotary type, designed for a speed of 3,000 r.p.m. Six of these sets were steam turbine driven and were located in the Rosherville Power Station, while the remaining six were electrically driven and located in the Robinson compressor station. These high speed rotary compressors were considerably larger than any compressor in operation at that date, but the subsequent growth of loading necessitated the adoption of larger units.

THE MAIN SYSTEM

The main system extends for approximately 14 miles with Johannesburg lying approximately at the centre of the system. The Rosherville Power Station and the Robinson compressor stations are 5½ miles apart. In order to meet the increasing demand for compressed air the installation of an electrically driven station at Canada Dam (a point about 3½ miles beyond the western extremity of the existing pipe system) was undertaken in 1930, two 6,000 kW. (8,000 h.p.) units being installed.

The main system is now supplied from three compressor stations owned and operated by the Escom-Rand Undertaking at a pressure of approximately 105 lb. per sq. in. gauge. Rosherville operates by steam power, while Robinson and Canada are equipped with electrically-driven compressors. In addition, five steam-driven compressors at Brakpan supply a local mining load at 80 lb. per sq. in. gauge. The installed compressor capacities of these stations are as follows:

	cu. ft. per min.
Rosherville	391,000
Robinson	114,000
Canada Dam	194,000
Brakpan	68,900

Distribution of air in the main system is effected through 42 miles of pipe-line varying from 27½ in. to 6 in. in diameter. The pipes are in standard lengths of 26 ft. and 40 ft. Only 14 per cent of the total length of piping has a diameter of 12 in. or less. The pipes are of mild steel, lap welded, and those above 6 in. diameter have one plain end and one bell-shaped end to form a stuffing box joint. The loose flanges are of wrought iron. To facilitate the original work of installation and the subsequent maintenance of the pipes, sleeves were used for making the final connection between the pipes and all fixed points, such as anchored valves and bends. These sleeves, of which there are nearly 300 on the system, are merely short lengths of pipe belled at each end and of sufficient diameter to slide comfortably over the plain ends of the standard pipes they interconnect. The sleeve is slipped on to one pipe, then drawn over the gap of a few inches between the ends of the two pipes, and jointed in the usual manner in the stuffing boxes at each end of the sleeve. Stuffing box joints are used only on pipes whose diameter is more than 6 in.

In order to remove the moisture condensed from the air as it cools and the grit (produced by internal corrosion) which collects in the system, suitable devices were fitted to the pipes at selected points along their routes. There are

over a hundred water traps on the system, most of which have grit collectors, and these have given very satisfactory service. Care was taken when laying out the system to grade the pipes to definite points, thereby avoiding pockets where water collection would restrict free passage of air.

The pipes are subject to internal corrosion over those portions of the routes in which condensation of moisture takes place, but the aggregate length of mains for which these conditions apply is only about five miles. Under these conditions, it was impossible to select routes involving no risk of contamination by seepage from slimes dams and sand dumps, or by deleterious drainage from other sources. When the system was originally installed, the pipes were laid in what appeared to be good soil, but subsequent inspection disclosed active corrosion at various points. It was eventually decided to open up the pipes on the hot section and support them on concrete blocks, either above ground level, where feasible, or in trenches properly fenced. Similar steps were taken on cold sections where the conditions for corrosion were especially severe. In some instances, after heavy rain, contaminated water reached the raised pipes and caused corrosion of the surfaces resting on the concrete piers. This localized corrosion was overcome by metallizing with lead the portions of the pipes in contact with the concrete.

The measurement of compressed air in the large quantities required introduced a new and difficult problem. Methods had to be devised for testing the sample compressors, and commercial meters had to be specially designed for measuring the number of air units supplied month by month to the various mines. It was agreed that a series of shaped orifices, widely spaced in series in a straight pipe, should be used for testing the compressors. Mr. A. M. Robeson, then consulting engineer to the Rand Mines group, designed and constructed a large master meter for use as an ultimate standard of reference in case of dispute, and for calibrating the orifices and the various meters for commercial measurements. This master meter was erected in an air-testing station at the Ferreira Deep mine. Being of the displacement type, it enables direct measurement to be made without the use of empirical formulae. Tests have shown that, when working at full capacity, the maximum error due to leakage past pistons, valves, stuffing boxes and joints is less than one part in 2,000.

COMMERCIAL MEASUREMENT

For commercial measurement the Venturi type of meter was selected because it offered the following advantages: No moving parts are necessary in the path of the air; the characteristics of the Venturi throat do not vary over long periods of use; the registering mechanism can be calibrated on the spot by means of a standard deadweight pressure tester; the loss of pressure in the main circuit is small.

For measuring the smaller supplies taken by industrial consumers, the V.F.P. adopted a chart drawing instrument known as the F.M.L. graphic recorder. This is a gate meter operating with a differential aperture at the gate. Though relatively inexpensive, these meters are robust and reliable, even under the onerous conditions of mining underground.

Statistics relating to the two compressed air systems in respect of the year 1952 show that the total installed capacities of the compressed air plants at the main system and Brakpan system were respectively 99,060 a.u. per hr. and 7,880 a.u. per hr. The annual output of the main system was 247,659,700 a.u. and that of Brakpan 17,387,190 a.u. The maximum sustained load (sent out in one hour) was 75,620 a.u. per hr. by the main system and 6,430 a.u. per hr. by Brakpan. Ninety-five per cent of the total output of the undertaking was used for gold mining and the balance for industries and a supply to a municipality.

The Mineral Resources of Moçambique

The article which follows is compiled from a review of the history and extent of the mineral resources of Moçambique to a comparatively recent date, together with notes on the developments recorded during 1953. These latter notes were contributed by Dr. L. L. Colin, lately metallurgist in the Mines Department, P.E.A., who considers that the overall picture of Moçambique's efforts regarding the mining industry is difficult to assess at the present experimental development stage.

A considerable variety of minerals has certainly been discovered in Moçambique, but so far few occurrences of major economic value have come to light. An English geologist, Mr. T. C. F. Hall, who made a survey for the Portuguese government a few years ago, considered that indications did not point to the existence of valuable minerals in payable quantities. In his opinion the pegmatitic formation of the country, particularly the northern section above the Zambesi, indicated that any minerals present would be in unpayable small pockets rather than in continuous reef formation. This opinion was confirmed by E. Roland, a Belgian engineer and geologist, who carried out a considerable amount of prospecting in the Tete district.

On the other hand, other authorities such as Dr. L. L. Colin have expressed more optimistic views regarding future prospects. In a survey of known mineral resources published in 1943 he referred to various occurrences of considerable extent awaiting favourable opportunities for exploitation. So far the more sanguine expectations have not been borne out by the results achieved. On the other hand, prospecting and development have unquestionably been hampered by the lack of communications and the prevalence of malaria and tsetse fly in many regions.

In a communication recently received by *The Mining Journal*, Dr. Colin stated that the past year has seen a quickening up of development in a few of the older mining concerns, but the overall picture of the Colony's mining effort is difficult to judge at the present experimental development stage.

The granting of financial and technical assistance to the Longyear Company created a great deal of interest but until all the preliminary work is completed little can be said about the effect of this survey on the economic future of Moçambique. In addition to geological ground study, the company will carry out a thorough aero photographic survey since their experience has shown that important geological data can be thus obtained which would otherwise be hidden by bush to ground observers.

GOLD DEPOSITS

The failure of the Manica goldfields to fulfil their early promise was indicated by the number of mining companies and syndicates which were obliged to suspend operations. Two of the best-known mines operating in this field were the Andrada mine and the Moçambique-Macequece. The former company owned a large number of alluvial claims along the Revue River, as well as the only producing mine of importance in this region—the Braganza. The alluvial claims proved so promising that a dredger and machinery for the erection of an electric generation station were procured and operations started at the end of 1913. Moçambique-Macequece owned the Guy Fawkes mine, which in 1916 was responsible for nearly half the reef output. From 1890 to 1935 the quantity of gold produced in Manica was 179,381 oz.

Systematic mining dates from 1892, when the Zambesi Company acquired the mineral rights over the whole of the Tete district. The chief gold areas lie mainly to the north of Tete and particularly in the elevated region bordering on British Nyasaland. In modern times considerable prospecting and mining have taken place, but, as in Manica, many of the ventures proved short-lived. After the First

World War the only mine still in operation was the Lolelo, some 150 miles north of Tete. Here a large auriferous lode, 25 ft. thick, was discovered, which assayed 8 dwt. to the ton. In 1912 the mineral exploitation of the Tete district was entrusted to the Zambezia Mining Development, with a capital of £250,000, which undertook to survey the mining regions and provide for their development.

During the last quarter of a century there has been no appreciable increase in the gold production of Portuguese East Africa. Most of the reef mines are two or three stamp propositions, and the bulk of the output is from alluvial. In 1949, the latest year for which figures are available, there was an output of about 77 kg., mainly from the Tete and Beira regions. The chief producers are the Empresa Mineira de Alto Ligonha and the Companhia de Moçambique, an old concern, dormant for years through lack of finance and technical administration, which received a new lease of life last year by American assistance. The pegmatite deposits are probably the most interesting of any in the Colony and contain beryl, tantalite and mica in large quantities. The surrounding greisen country has enormously rich pockets of gold while the rivers all carry alluvial gold, which has been recovered by the natives with primitive wooden pans. The Diorite bars in the river provide natural traps and many kilos of gold have been sold from this area.

CONSIDERABLE COAL RESERVES

Surveys made about 12 years ago showed that reserves of coal totalling 105,100,000 tons were immediately available in the Tete coalfields without big underground workings. Belgian geologists subsequently identified another 15 seams in other basins. Generally speaking, the quality is much the same as that of Wankie coal. Since labour is abundant in this area and much cheaper than that of the Natal and Transvaal collieries, it was anticipated that on the completion of the Tete Railway these coalfields would become important producers, and that Beira would become a serious competitor to Durban and Lourenco Marques in the export trade.

At present coal is being mined in the Moatize district near Tete by the Companhia Carbonifera de Moçambique. In 1950 production amounted to 56,000 tons, the bulk of the output being locally consumed. It is intended to build up an export trade as soon as the mines can be suitably equipped.

The coal mine at Chipanga, Tete, suffered a disastrous blow recently when an explosion destroyed practically all the machinery and reduced the output almost to nil. It became necessary for the authorities to arrange the import of 10,000 tons of coal to Beira from the Union and Southern Rhodesia, until operations again resume their normal trend.

BASE METALS

Considerable quantities of copper have been produced in Manica, notably from the Edmundian mine, originally owned mainly by the Consolidated African Copper Trust and subsequently acquired by the South African Copper Trust. During the Second World War tin was worked on a small scale at Inchope in the Chimoia district. The cassiterite is at times associated with other minerals in reefs in the pegmatites and averages in value about 1.2 per cent Sn. The

reefs vary in width at irregular intervals, but Dr. Colin stated that no serious effort had been made to evaluate the prospects of these deposits as potential large producers of concentrates.

Associated with the cassiterite in small quantities are wolframite, tantalite and columbite, all of which have been recovered from washings of alluvial. The quantities are small, and Colin considered that these minerals could only be worked profitably as by-products of tin production.

Of the older worked deposits a new spurt of life has been given to the Inchope district where the Sociedade Mineira de Inchope last year installed a pilot plant to recover the cassiterite from the greisen zones. Recent work from old adits opened up show satisfactory veins at an inclined depth of some 40 ft. and the company is looking forward to a more active year.

Substantial quantities of tantalite and columbite have been found, together with samarskite, in the River Logonha district of Moçambique, some 100 miles from Ribau. The samarskite contains uranium and quantities of rare earths.

URANIUM DAVIDITE FIELDS

At Tete there is still keen interest in the Uranium Davidite fields and through the financial assistance of the Entrepoto Comercial de Mocambique a gravity concentrator mill is being erected. The bulk of the high grade alluvial has been collected and sold and the dissemination of the radio active material in the dolomitic rock is extremely low, less than 0.1 per cent, and it remains to be seen with what economic success an ordinary gravity concentrator works. Unfortunately the radio-active constituent is comparatively difficult to treat in later chemical processes, otherwise there is little doubt that this deposit would now be fully producing.

Lead has been found as galena in many of the gold reefs of Manica, but never in great quantity. Excellent samples of this mineral have also been obtained at Chicova in the Tete district.

Wartime demands lead to extensive prospecting for the high-grade corundum known to exist in the Tete district, and a very large tonnage has been proved. The quality of the corundum is high grade, averaging between 92 and 95 per cent Al_2O_3 . Some high-grade corundum has also been found near Vila Pery.

Samples of good quality mica have been found at Gondola and Chimoia in Manicaland, but in most cases transportation has presented serious difficulties. However, a very large occurrence of phlogopite mica exists south-east of Lalaua, a few miles from the narrow-gauge railway running inland from the port of Moçambique to Ribau. Two large deposits of muscovite occur in very regular concentrations near Morropula, which is about 100 miles from the railway at Ribau. The production of both phlogopite and muscovite is undertaken by the Empresa Mineira do Alto Ligonha. In 1950 the total output was in the region of 103 tons.

Graphite is found in abundance at various localities in both the Manica and Tete districts. Laboratory investigations on a deposit at Gorongoza showed that with flotation a 92 per cent graphite product could easily be obtained, accompanied by a recovery of 97 per cent of the graphite in the ore. At Angonia, where graphite occurs in a very altered granite, high values have also been obtained. At Muecate, in the Moçambique district, a small plant has been profitably worked on a high-grade vein. At present three companies are engaged in the production of graphite from deposits in the Angonia and Nampula districts. In 1950 there was an output of some 110 tons.

A large deposit of high-grade bauxite exists near Penhalonga, but the quantity of readily available low silica material was reported to be restricted. Wankie Colliery Limited are producing bauxite, mainly for use in the manufacture of refractory bricks. In 1950 exports amounted to 3,765 tons. The existence of rich clays and the discovery of nodules of gibbsite containing 36.7 per cent and 62.4 per cent alumina respectively have been reported.

Before the war there was a small output of quartz crystals from Alto Molocue in the Qelimane district, but all work ceased when the demand declined. These crystals occur in pegmatites and are almost invariably clear and without striations. The largest specimens recovered have been over 5 ft. high.

Good quality garnets with a hardness between 7.0 and 7.5 have been found in the district of Qelimane. Preliminary prospecting has disclosed a large tonnage, but economic exploitation is dependent on transport facilities to the nearest railhead, Blantyre.

Vast occurrences of high-grade haematite and magnetite are known, but so far the territory's abundant iron ore resources have not been exploited. Talc of good quality occurs in the territory and a large deposit of kaolin is potentially interesting. Among other minerals reported to be potentially exploitable are rich lime deposits at Inhalinga, monazite, gadolinite, and gem minerals such as topaz, aquamarines, tourmalines, emeralds and beryls.

Reference should also be made to the reputed mineral oil deposits in the Lake Nhangela region of the Inhambane district. Prospecting for oil was undertaken in this region as far back as 1905-11, when boring was carried out to a depth of 800 ft. before being abandoned. Authoritative works record that ozokerite or solidified petroleum was discovered and that liquid oil was actually pumped from a borehole. Hopes of finding oil in Portuguese territory have not been abandoned, notwithstanding the failure of Inyaminga Petroleum (1934), which drilled to a depth of 8,083 ft. without success. The concession held by the Manica Trust from the Moçambique Company expired in 1940, but further oil concessions were subsequently granted by the Portuguese Government.

TRANSPORT FACILITIES

The construction of railways and roads has been accorded the highest priority in the Portuguese Government's plans for developing Moçambique. The Port of Beira, expropriated in 1948, last year handled an increase of 12½ per cent over 1951's record total. New mineral and oil extensions have recently been completed at this port. Owing to its geographical situation in relation to the Witbank and East Rand coalfields, Lourenço Marques has become one of the most important coal ports in the world.

A six-year plan of development for the province of Moçambique recently approved by the Portuguese Government involves an expenditure of £29,000,000. The works projected include hydro-electric and irrigation schemes, railway construction, aerodromes, mineral prospecting, and the establishment of a land bank.

Generally the past year has not seen a great expansion of mining activity but prospecting and preliminary work has gone ahead to a greater extent than in the past. The drilling for oil continues and it is said that preliminary results are disappointing, but this is not unexpected. The immediate future still depends on the success of this campaign since nothing else really big and suitable for the investment of large moneys has, as yet, been uncovered. Mineral wealth is scattered through the mountainous regions, away from the coast, and in most cases far removed from all communications, and, therefore, of little immediate value.

MACHINERY AND EQUIPMENT

The British Thomson-Houston Co., Ltd., in 1953

Among the various equipments supplied by The British Thomson-Houston Co. Ltd. during 1953, many were manufactured specifically for use in the mining industry. Orders for more than twenty electric winders provided a cross section of current practise and development, and it is of interest that in order to obtain the exact performance required for automatic winding, the manufacturers advocate closed loop control for both Ward-Leonard and A.C. winders. Already Ward-Leonard equipments operating on this principle are nearing completion for the N.C.B. and during 1953 several A.C. closed loop winders were ordered. A 750 h.p. A.C. equipment for automatic operation, the rotor control gear being of the liquid type with amplydne-electro servo, is for supply at Roslin, Scotland, while two A.C. winders are to be sent to Polkemmet Colliery, Scotland, one of which is to be automatic. These units have contractor and resistance rotor control gear.

In some cases closed loop control may be used on non-automatic A.C. winders, as an additional safety factor. Two 1,200-1,750 h.p. sinking winders of this type are now being erected on site and two others of 1,150 and 1,500 h.p. respectively have been ordered for Barony, Ayrshire. Of special interest is a new larger motor for the winder at Michall Colliery, Fifeshire. This winder has been in service for some years and was manufactured by Fullerton Hodgart and Barclay with electrics by B.T.H. It is stated to be the first 6,600 volt A.C. winder installed in the United Kingdom. The new motor is required because of increased duty and will be the largest single A.C. winder motor in the country. Dynamic braking is being added simultaneously to this installation. A 300 h.p. winder at Florence Colliery is to be installed in an underground chamber, and is being supplied with cubicle enclosure for its 3,300 volt air break reversing contactors. Winders equipped with the B.T.H. dynamic braking system volts-per-cycle regulator are now working in Britain, Spain and South Africa, where the 1,340 h.p. winder at Harmony has been recently commissioned.

Apart from winders, other electrical apparatus for mines ordered during 1953 covers a wide selection of the manufacturers' products, and includes turbine plant, transformers, motors, control gear, lamps and lighting equipment. The electrification programme of the N.C.B. has resulted in increased switchgear manufacture. In addition, there have been several installations of special design in connection with mine car handling, the MCU 82, designed to N.C.B. specification PS/1950, has been added to the company's range of flameproof mining equipment and the B.T.H. mining transformers and transportable sub-stations have been redesigned and are available in 150 kVA and 250 kVA sizes with a standard voltage ratio of 3,150/565.

Important New Dollar Earning Development

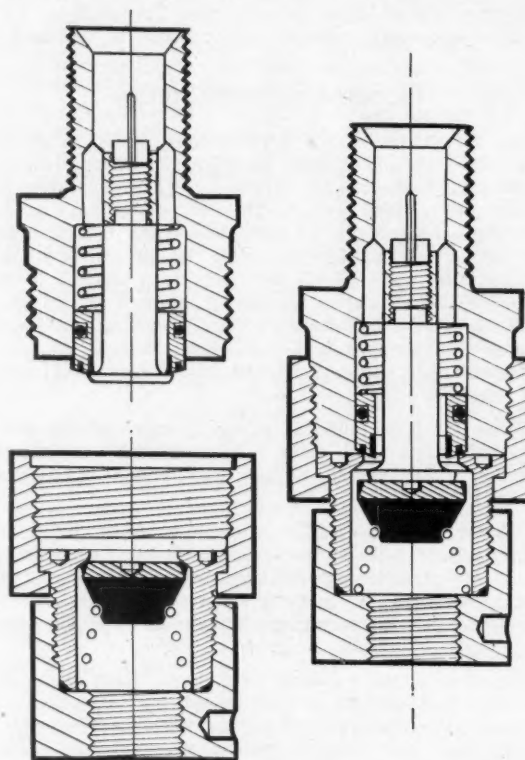
It has recently been announced that the well-known fire protection and safety engineers, The Pyrene Co. Ltd., this month entered into a contract for the purchase of the whole of the share capital of the Pyrene Manufacturing Company of Canada Ltd., previously a wholly-owned subsidiary of the Pyrene Manufacturing Company Incorporated of New Jersey. The entire share capital of the Canadian company was purchased out of The Pyrene Co. Ltd.'s own financial resources, and the transaction follows six months after the acquisition by British interests of the majority holding of the U.K. company previously held by the United States concern. The purchase of the American company's interests was a dollar saving deal, whereas the purchase of the Canadian company's shares becomes a dollar earning deal.

Purchase of the share capital of the Canadian company was effected at a cost of U.S. \$675,000 and permission for transfer has been granted. The company has its head office and factory in Toronto, and activities consist mainly of the manufacture, assembly and sale of fire extinguishers, other fire-fighting equipment and non-skid type chains. These important developments in the history of The Pyrene Co. Ltd. may well contribute

towards a greater degree of fire safety by making a wider range of fire-fighting equipment available through a more extensive area.

A Self-sealing Coupling

A method of making a pressure pipe joint which is completely leakproof is supplied by the self-sealing coupling manufactured by Dowty Auto Units Ltd. It is easily coupled or uncoupled by hand without loss of fluid or risk of an airlock, and provides a rapid method of joining hydraulic pressure lines. The male half of the coupling embodies a simple and practical arrangement of a piston with two bonded rubber rings, and a mushroom headed valve which, when junction is effected, actuates a conical valve in the female half. The



The male, female and combined Tractaline self-sealing coupling

piston and the conical valve are spring-loaded to obviate airlock when coupling and ensure a clean and instantaneous cut-off during uncoupling.

For working pressures up to 3,000 lb./sq. in. and suitable for use with most fluids the range is comprehensive, all conventional sizes being included. One particularly popular model, the "Tractaline," is recommended for coupling the pressure lines of tractors.

No tools are required to couple or uncouple the units, hand tightening of the eared nut being adequate to ensure a leak-proof joint. Ease of servicing is another important feature of the design ensuring reduced operational costs; each unit is easily dismantled for inspection and separate half couplings can be supplied.

For any industrial application, the Dowty Self-Sealing Coupling provides an answer to problems in a number of fields where a rapid leakproof method of joining hydraulic pressure lines is required.

METALS, MINERALS AND ALLOYS

In the past week the prices of all four L.M.E. metals have shown marked weakness in London, although some of the lost ground has been recovered in the past couple of days. This weakness has been felt in the U.S. where lead and zinc have both moved a $\frac{1}{2}$ c. lower, and one way and another the U.S. metal market looks shaky. Aside from the very cautious buying policy being evidenced for January and February delivery, with the extent of the expected recession still unknown, the market is now confronted with anticipated declines in military consumption following an announcement this week by the O.D.M. that smaller rations of steel, copper and aluminium are to be earmarked for defence and atomic energy requirements in the second quarter of the year. It is also being forecast in military circles in Washington that army contracts worth \$500,000,000 will have been cancelled by June 30.

It is difficult to escape the feeling that some of the more buoyant economic forecasts which have been coming out of the States in recent weeks have been deliberate whistling in the dark born of a determination that if the American economy does get into a slump it shall at least be said that it talked itself into one.

COPPER.—This is a case in point where the indicators in the U.S. are anything but promising. Bookings for January delivery are still running at around 30 per cent below the December rate and demand for February is at present extremely restricted. Although producers have not lowered their price in sympathy with London quotations some dealers are reported to be offering refined copper as low as 29 c. for spot delivery while the price for copper scrap is now down to 22 c. for No. 2 copper wire scrap and 20½ c. for light scrap. These prices are about equivalent to 26½ or 27 c. per lb. for refined metal, and as it will take three months or more for scrap purchased now to find its way back on to the market as refined metal, this price may be taken as a pointer to the extent of the current market backwardation.

Some U.S. copper producers are reported to be considering whether to cut down production in view of the falling off in domestic demand.

Meanwhile the latest statistics of the Copper Institute show an increase in world production last year coupled with a progressive increase in stocks as revealed in the following table:—

	Production			Stocks		
	Dec. 1953	Jan.-Dec. 1953	Jan.-Dec. 1952	Dec. 31 1953	Nov. 30 1953	Dec. 31 1952
U.S.A.	123,296	1,395,003	1,189,112	89,193	93,274	58,858
Other countries ..	98,527	1,122,766	1,196,422	280,530	261,096	130,103
World	221,823	2,517,769	2,385,534	369,723	354,370	188,961

* Excluding U.S.S.R., Japan, Australia, Norway, Sweden and Yugoslavia.

News from Chile continues to be rather indefinite. There are rumours in the Santiago press suggesting that owing to difficulties in selling all Chile's current production, the Minister of Mines, Senor Cuevas, has proposed that sales made to the United States and Europe be proportionately distributed between Anaconda and Kennecott in accordance with the combined production of their Chilean and North American plants. The Minister is quoted as saying that these proportions should be 25 per cent Chilean and 75 per cent North American. In view of the fact that something like 70 per cent of Anaconda's copper production is Chilean as against 30 per cent in the case of Kennecott it is difficult to imagine such a blanket arrangement being acceptable to the producers.

Since these rumoured proposals Senor Cuevas' resignation has been reported.

LEAD.—The lead market has had a bad week, the spot price having fallen to £82 compared with £88 a week previously. In the process, the persistent backwardation has, however, at last disappeared and three month metal is now at a slight premium. The widening between the London and New York price last week increased the weight of foreign offerings on the New York market which reacted on Monday with a $\frac{1}{2}$ c.

reduction. The spot price now stands at 13 c. Reports from New York indicate that demand was fair before custom smelters initiated this cut but that consumer reaction afterwards was to wait and see. It is reported that considerably larger offerings of scrap metal are also coming on to the market.

At £82 per ton, lead on the London market is equivalent to about 10½ c., and it seems unlikely that as wide a gap as this can be maintained for long between the London and New York quotations, even allowing for the U.S. import duty.

TIN.—The Chinese miners in Malaya last week voted in support of the proposed international tin agreement and there now seems little doubt that the outcome of the referendum (see this column last week) will be to give the legislative council a mandate to support the scheme. If the agreement comes into force Malaya will be responsible for contributing about 36½ per cent of the 25,000 tons of tin required for the buffer stock. This will be called up in three instalments of which the first will be 15,000 tons. Of this, Malaya would have to contribute 5,500 tons. The financing of this large contribution, which is estimated at around 50,000,000 Straits dollars, has been one of the main difficulties in the way of Malaya accepting the scheme. The threatened burden will, however, now be eased as a result of an arrangement whereby the U.K. Government will lend Malaya enough money to finance its contribution to the buffer stock, the loan being gradually paid off through a levy on the industry.

The Chief Inspector of Mines in Malaya has stated that the allocation of Malaya's tin quota will be on the basis of 37 per cent for Asian miners and 61 per cent for Europeans, the odd 2 per cent being for panners working the stream beds. On the vexed question of the sale or transfer of quotas, to which Mr. G. W. Simms referred at a recent company meeting (see this column January 1), miners who do not wish to, or cannot, produce their quota will, as under the pre-war scheme, be allowed to sell it to another mine at a mutually agreed price. It would appear that any such transactions will be under the supervision of the Department of Mines. The interests of those mines which are flooded out or closed down on account of terrorist activity are to be safeguarded by the allotment of a "dormant quota" which can be taken up when they are in a position to recommence production.

ZINC.—At the beginning of this week the St. Louis spot price for zinc dropped $\frac{1}{2}$ c. to 9½ c. with the export price nominal at 8½ c. Although zinc has declined on the London market since last week, both here and on the Continent it has a more confident look than in the States where there is still talk of further cutbacks in production in the face of the worsening stock position.

ALUMINIUM.—Owing to falling export sales Northern Aluminium have announced a reduction in operations of two shifts per week at their Rogerstone mill. Some reduction in activity is also reported for their Banbury works. A statement issued by the company this week says that owing to the lower manufacturing costs of foreign competitors they are finding it increasingly difficult to obtain business abroad.

The British Aluminium Co. is reported from Sierra Leone to have been granted an exclusive prospecting licence to search for bauxite deposits in an area covering about 150 square miles around the peninsula running north to Freetown. It is not without interest that this area is only some 70 miles south of the Iles de Los in French Guinea, from which Alcan has been drawing some of its ore.

CHROME.—Turkey's chrome ore exports are reported to be declining rapidly. Present shipments are mainly on account of old contracts and very little new business is in sight. Prices appear to be the main difficulty, quality standards being apparently well maintained.

A new mill controlled by the Vanadium Corp. is now in operation in Southern Rhodesia, concentrating alluvial and metallurgical grade ore. Presumably the mill is treating deposits from the Great Dyke region which are controlled by this company through a subsidiary.

PLATINUM.—Indications are that U.S. consumption of platinum in 1953 was around 250,000 oz., a 10 per cent increase over 1952. Trade quarters in New York are forecasting a further increase in the current year of between 10 and 20 per cent.

At the end of last week the New York platinum price was cut by \$1 per oz. and is now quoted at \$90/92. This decline apparently reflects direct offers of Soviet platinum on the New York market. Although large quantities are reputedly on offer no reports have appeared yet of any sales being concluded. Hitherto Russian platinum has been finding its way to the States via European dealers.

Iron and Steel

The British iron and steel industry is actively interested in the movement for freer trade which is the cardinal point of the economic policy approved by the Australian conference of Commonwealth Finance Ministers. For the first time since the war rising production of steel has overtaken the demand, and British makers are now in a position, not only to provide increased tonnages for shipment overseas, but also to sell at keenly competitive prices. The huge expenditures on capital re-equipment have raised the stature of the British steel industry to such a degree that the European Coal and Steel Pool has renewed its overtures for closer working arrangements and is now angling for a loan from the U.S.A. with the avowed purpose of undertaking similar investments to reduce production costs.

On the subject of prices, the High Authority has decided to allow variations within 2½ per cent of the published price schedules without necessitating any change in the basic price. No such elasticity is permitted in the observance of the fixed maximum home prices of British steel, which, it is understood, will shortly be reviewed. In view of the prospective rise in railway rates any change, if change there be, is expected to be in an upward direction.

All the British steel plants are extremely busy and production, which was running at the annual rate of 18,250,000 tons in the final quarter of last year, is still rising. Not surprisingly there has been a steep drop in imports. During what the trade describes as "a temporary slump period," imports of steel plates and of pig iron are still necessary, but very small tonnages of foreign semis are now required, home requirements being generally covered from home sources.

A very substantial demand for black and galvanized sheets has also developed. Nor is this demand confined to the home market. Some useful export orders have been booked and most of the quotas for the first six months have already been taken up.

There has also been an encouraging improvement in the export business placed with the light castings and engineering industries, which is reflected in the more active demand for high phosphorous pig iron.

The London Metal Market

(From Our Metal Exchange Correspondent)

Last week has seen a general reduction in the price levels of copper and lead, with a sympathetic lowering in the price of zinc. It is difficult to state any definite factor which has given rise to the fall in the metal prices which have taken place other than the fact that the majority opinion was that prices were too high. The copper price has fallen largely owing to offerings of three months' metal which appear to have emanated from U.K. producers. In contrast to the U.K., however, Continental prices for both cathodes and wirebars have remained very much above the London price, and there are, therefore, a number of dealers who consider that the present London quotation is far too low and must rise to the parity at which American copper is being sold to the Continent. Demand in the U.K. has been fair, but as the majority of big consumers have long-term pricing contracts with producers' agents, this has done little to strengthen the market quotation.

The alteration in the zinc quotation has been influenced by the lower copper and lead prices, but offerings from sources outside the U.K. have been balanced to a large extent by demand for metal for use in the brass and galvanizing trades in this country. During the week the American price has been

reduced by ½ c. per lb., but this can have little effect on world trading as those who export to the States are more interested in the dollar angle than in the price which they receive for the metal.

The lead market has been extremely weak and the undertone remains uncertain, as it is felt that if there is any further decline in the price of copper, lead will follow suit, and the good consumer demand is not large enough to arrest any decline brought about by international price charges.

The tin market has followed a course of its own, and it is impossible to foretell future price movements owing to the shadow of the Tin Agreement. Both in the U.K. and Singapore, however, demand has been relatively good, and both the London and Singapore prices have been maintained in spite of the general "bearish" tendency in metal markets as a whole. On Thursday morning the Eastern price was equivalent to £647½ per ton c.i.f. Europe.

Closing prices and turnovers are given in the following table:—

	January 14		January 21	
	Buyers	Sellers	Buyers	Sellers
Tin				
Cash	£660	£662½	£652½	£655
Three months	£631	£632½	£628	£630
Settlement		£662½		£655
Week's turnover		380 tons		640 tons
Lead				
Current month	£88	£88½	£82	£82½
Three months	£87½	£88	£82½	£82½
Week's turnover		2,500 tons		4,300 tons
Zinc				
Current month	£73½	£73½	£70½	£70½
Three months	£72	£72½	£69½	£69½
Week's turnover		5,050 tons		4,775 tons
Copper				
Cash	£226	£227	£219	£219½
Three months	£218½	£227	£208	£209
Settlement		£227		£219½
Week's turnover		4,675 tons		6,850 tons

OTHER LONDON PRICES—JANUARY 21

ANTIMONY

English (99%) delivered, 10 cwt. and over	£210 per ton
Crude (70%)	£200 per ton
Ore (60% basis)	22s./24s. nom. per unit, c.i.f.

NICKEL

99.5% (home trade)	£483 per ton
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OTHER METALS

Aluminium, 99.5% £156 per ton	Osmiridium, £40 oz. nom.
Bismuth	Osmium, £65/£70 oz. nom.
(min. 4 cwt. lots) 16s. lb.	Palladium, £7 15s./£8 10s. oz.
Cadmium (Empire), 13s. 10d./14s. 4d. lb.	Platinum, £27/£33 5s.
Chromium, 6s. 5d./7s. 6d. lb.	Rhodium, £42 10s. oz.
Cobalt, 20s. lb.	Ruthenium, £25 oz.
Gold, 248s. f.o.z.	Quicksilver, £61 15s. ex-warehouse
Iridium, £60 oz. nom.	Selenium, 30s. 6d. nom.
Magnesium, 2s. 10½d. lb.	per lb.
Manganese Metal (96%-98%) £225/£262	Silver 73½d. f.o.z. spot and f.d.
	Tellurium, 15s./16s. lb.

ORES, ALLOYS, ETC.

Bismuth	30% 5s. 0d. lb. c.i.f.
	20% 3s. 3d. lb. c.i.f.
Chrome Ore—	
Rhodesian Metallurgical (lumpy)	£14 5s. 6d. per ton c.i.f.
" " (concentrates)	£14 5s. 6d. per ton c.i.f.
" " Refractory	£13 17s. 6d. per ton c.i.f.
Baluchistan Metallurgical	£15 19s. 6d. per ton c.i.f.
Magnesite, ground calcined ..	£26 - £27 d/d
Magnesite, Raw	£10 - £11 d/d
Molybdenite (85% basis) ..	102s. 4d.-103s. per unit c.i.f.
Wolfram (65%)	World buying 150s. nom.
"	165s. nom. U.K. Selling
Scheelite (65%)	World buying 135s.
"	150s. nom. U.K. Selling
Tungsten Metal Powder ..	16s. nom. per lb. (home)
(98% Min. W.)	
Ferro-tungsten	13s. nom. per lb. (home)
Carbide, 4-cwt. lots	£35 13s. 9d. d/d per ton
Ferro-manganese, home ..	£52 10s. 0d. per ton
Manganese Ore Indian c.i.f. Europe	
(46% - 48%)	7s. 11d. - 8s. 4d. per unit
Brass Wire	2s. 4½d. per lb. basis
Brass Tubes, solid drawn ..	1s. 8½d. per lb. basis

FINANCE	Price Jan. 20	+ or - on week	O.F.S.	Price Jan. 20	+ or - on week	MISCELLANEOUS GOLD (contd.)	Price Jan. 20	+ or - on week	TIN (Nigerian and Miscellaneous) contd.	Price Jan. 20	+ or - on week
African & European...	23 1/2	+ 3/8	Freddies N.	9/10	+ 7 1/2	St. John d'El Rey	21/-	+ 1/-	Geevor Tin	9/9	
Anglo American Corp.	6 1/2	+ 1/8	Freddies N.	9/10	+ 7 1/2	Zams	32/-	- 3d	Globe & Base Metal	3/14	
Anglo-French	20/6	+ 6d	Freddies S.	9/-	+ 9d				Jantar Nigeria	7/7 1/2	
Anglo Transvaal Consol.	23/9	+ 1/3	F. S. Geduld	3 1/2	+ 1/8	DIAMONDS & PLATINUM			Jos Tin Area	13/-	+ 6d
Central Mining (21 shrs.)	30/6	+ 1/-	Geoffries	17/6	+ 2 1/2	Anglo American Inv.	4 1/2	+ 1/8	Kaduna Prospectors	2/1 1/2	- 3d
Consolidated Goldfields	50/9	+ 1/4	Harmony	29/11	+ 2 1/2	Casts	20/9		Kana Syndicate	2/1	- 3d
Cook, Selous Selection	30/10	+ 1/10	Horaine	12/3	+ 1/4	Cons. Diam. of S.W.A.	71/9	+ 3/6	London Tin	5/4 1/2	+ 1 1/2
East Rand Consols.	4/3	+ 4 1/2	Lydenburg Estates	15/9	+ 9d	De Beers Defd. Bearer	15 1/2	+ 1/4	United Tin	3/3	+ 3d
General Mining	4	+ 1/8	Merriespruit	9/9	+ 9d	Pots Platinum	9/6				
H.E. Prop.	41/3	+ 1/4	Middle Wits	17/-	+ 1/3	Waterval	15/3	- 3d	SILVER, LEAD, ZINC		
Henderson's Transvaal	8/6	+ 6d	Ofsits	51/3	+ 4 1/2			Brookers Hill South	42/6		
Johnnies	50/9	+ 1/3	President Brand	39/6	+ 2 1/2	COPPER			Burma Mines	1/9	
Rand Mines	35 1/2	+ 3 1/2	President Steyn	27/6	+ 3	Chartered	54/7 1/2	- 1 1/2	Consol. Zinc	28/9	+ 1 1/2
Rand Selections	35 1/2	+ 3 1/2	St. Helena	16/9	+ 9d	Esperanza	6/7 1/2	- 4 1/2	Lake George	5/14	- 1 1/2
Strathmore Consol.	36/3	+ 1/3	Virginia Ord.	14/9	+ 1/3	Indian Copper	3/9	- 3d	Mount Isa	33/3	- 6d
Union Corp. (2/6 units)	28/9	+ 1/-	Welkom	19/9	+ 1/3	Messina	3 1/2	- 1/8	New Broken Hill	23/9	+ 3d
Vereeniging Estates	3 1/2	+ 1/8	Western Holdings	4 1/2	+ 1/8	Nchanga	7/6	- 1/8	North Broken Hill	8/1	- 3d
Writs	36/10 1/2	+ 2/6				Rhodes. Anglo-American	47/9	- 1/8	Rhodesian Broken Hill	2/1	+ 3d
West Wits	43 1/2	+ 1/3				Rhod. Katanga	15/10 1/2	- 1 1/2	San Francisco Mines	16/-	- 9d
						Rhodesian Selection	14/-	- 6d	Uruwara	3/-	
						Rhokana	17/-		MISCELLANEOUS		
						Rio Tinto	19 1/2	+ 1/4	BASE METALS & COAL		
						Roan Antelope	14/-	- 1 1/2	Amal. Collieries of S.A.	41/-	- 3d
						Selection Trust	36 1/2	+ 2 1/2	Associated Manganese	44/-	- 6d
						Tharisa Sulphur Br.	53/9	- 1 1/2	Cape Asbestos	24/-	
									C. P. Manganes	55/7 1/2	+ 1 1/2
						TIN (Eastern)			Consol. Murchison	30/-	+ 1 1/2
						Ayer Hilan	24/6	- 3d	Dashaba	3d	
						Bangrin	8/-		Natal Navigation	2 1/2	
						Gopeng	7/3	- 7 1/2	Rhod. Monteelo	1 1/2	
						Hongkong	6/-	- 4 1/2	Turner & Newall	72/-	+ 9d
						Ipoh	15/-		Wankie	13 1/4	+ 3d
						Kamunting	8/9		Witbank Colliery	3 1/2	
						Leopon Dredging	4/3				
						Kinta Tin Mine	10/-		CANADIAN MINES		
						Malayan Dredging	26/-		Dome	\$28 1/2	
						Pahang	11/9	- 3d	Hollinger	\$23 1/2	+ 1/2
						Pengkalen	8/-		Hudson Bay Mining	\$7 1/2	
						Petaling	7/10 1/2		International Nickel	\$65 1/2	+ 1/2
						Pulantan	11/6		Minning Corp. of Canada	\$4	- 1/2
						Siam	7/1 1/2	+ 1 1/2	Noranda	\$5 1/2	
						Southern Kinta	23/-	- 9d	Quemont	\$11 1/4	+ 1 1/2
						S. Malayan	7/6		Yukon	4/13	+ 1 1/2
						S. Tronoh	7/6				
						Sungei Kinta	10/-		OIL		
						Tekka Taiping	5/6		Anglo-Iranian	8 1/2	- 1/2
						Tronoh	22/6	- 6d	Apex	43/9	- 1/3
									Attcock	38/-	+ 6d
						TIN (Nigerian and Miscellaneous)			Burmah	57/6	+ 7 1/2
						Amalgamated Tin	11/4	+ 3d	Canadian Eagle	28/6	
						Batell Tin	17/9	+ 1 1/2	Mexican Eagle	19/9xc	+ 6d
						Bisichi	4/7 1/2	+ 1 1/2	Shell (Bearer)	18 1/2	- 1 1/2
						British Tin Inv.	13/9	+ 1/3	Trinidad Leasehold	24/9	+ 2 1/2
						Ex-Lands Nigeria	3/-		Ultramar	27/6	- 1/2

COMPANY NEWS AND VIEWS

M.J. to Give New Presentation of Rand and O.F.S. Quarterly Results

The quarterly results published by the Rand and Orange Free State gold mines provide the earliest and the most complete data available about the operation of these mines, aside from that contained in the annual reports, and in many ways, because of the promptness of publication of these quarterlies which is nowadays achieved, the practical value of the former is often greater than of the annual reports themselves, which inevitably are published several months after the period to which they refer.

Valuable as the quarterlies are, by themselves, they only give the results for the three months immediately past, and we have felt for some time that their value to our readers could be much enhanced if we were, at any rate in the case of producing mines, to publish cumulative and comparative figures showing the results for the current financial year to date compared with performance for the corresponding period in the preceding year. Readers who are familiar with our method of treating the monthly South African gold returns will appreciate the principle of the method we now intend to adopt and which will be applied to all the financial, development, and milling results published in the quarterlies.

Unfortunately, the table cannot be published until all the quarterly results have been announced. Meanwhile, we are confining ourselves this week to noting the more outstanding development results so far announced for the December quarter.

The December quarterly reports of the Anglo American Corporation of South Africa group exceeded the most optimistic market expectations, the exceptionally good results being the best announced since underground development commenced in the Orange Free State goldfield.

Perhaps the most outstanding result was that achieved by Western Holdings. This was obtained from a cross-cut from the 41 Haulage North advanced towards the Free State Geduld property which, by the end of the quarter, had reached a point approximately 1,000 ft. from the common boundary, where in 1946 and 1947 two boreholes gave the remarkable values of 23,000 and 12,000 in. dwt. The cross-cut was developed towards the Basal Reef and since the end of the December quarter a box-hole from this cross-cut intersected the Basal Reef, and samples taken from these sections gave an average value of 7,518 in. dwt.

Although Free State Geduld accomplished 11,331 ft. of underground development only a mere 70 ft. were on the Basal Reef of which 65 ft. were sampled. Nevertheless, every foot was payable and averaged 136 dwt. over 12.77 in., equivalent to 1,737 in. dwt. President Brand also reported high development values, 99 per cent payability being recorded of 2,275 ft. sampled which averaged 104.7 dwt. over 17 in., equivalent to 1,785 in. dwt. President Steyn showed values in excess of 500 in. dwt.

Western Reefs announced an initial profit figure from its uranium and sulphuric acid plants which were started up towards the end of the September quarter, the profit from that time to the end of December being estimated at £228,000. (This figure includes an allowance of £32,000 towards redemption of the capital cost of the acid plant.) Daggafontein increased its uranium profits in the December quarter to £257,000 (including £31,000 acid plant redemption allowance) compared with £228,000 in the September quarter.

The December quarterly return from West Rand Consolidated Mines, in the General Mining group, disclosed that the net profit from uranium operations expanded from £186,509 to £204,176. On the other hand, gold recovery per ton decreased from 2.7 dwt. in the September quarter to 2.6 dwt. in the December quarter and gold profits contracted from £210,203 to £177,234—excluding £3,698 (£12,095 in the September quarter) received from premium gold sales.

West Rand has also announced that in future its monthly and quarterly returns will show separately the results from gold and uranium.

Stilfontein, in the Strathmore Consolidated group, announced its first earnings from uranium production. The profit for the December quarter was £44,833 but the company's plant was not running until October 1. The company's working profit from gold was £332,605. Ellatton Gold Mining, the shallow gold and uranium producer in the same group, revealed that gold production commenced on January 1, the metallurgical trials having been carried out in the December quarter. Development footage accomplished totalled 9,852 ft. Of this total 3,015 ft. were sampled of which 97 per cent proved pay-

able averaging 545 in. dwt. In the September quarter payability was 91 per cent of 1,440 ft. sampled the average value being 484 in. dwt.

The December quarterly reports of the companies in the "Johnnies" group were somewhat disappointing. Freddie's North announced a lower reef payability of 79 per cent against 88 per cent in the September quarter and while the figure is still commendably high it only covered a total sampled footage of 545 ft. compared with 2,335 ft. sampled in the preceding quarter. Reef payability at Freddie's South was virtually the same as for the preceding quarter, 1,740 ft. against 1,430 ft., but the values were much better being up to 308 in. dwt. against 260 in. dwt. in the September quarter. No development results were given for Witwatersrand Gold which is in the process of closing down. Further details of the results achieved in the December quarter by the companies in the Johannesburg Consolidated Investment group are given on page 109.

British Tin Investment Pays 30½ Per Cent

British Tin Investment Corporation in an advanced profit statement have announced the recommendation of a final dividend of 16 per cent, making, with the interim of 14½ per cent, a total distribution for the year ended December 31, 1953, of 30½ per cent compared with 18½ per cent in the preceding year. The total dividend payment required a net £353,127 against £204,456 in 1952.

The provisional net profit of the Corporation and its subsidiary for the year, after deduction of tax, was £366,725 against £214,892. The U.K. taxation charge in arriving at the net profit figure was £187,720 (£398,045), after allowing for a credit of £90,580 transferred from the provision of £106,000 made in 1952 for E.P.L.

In consequence of the retrospective effect of the Finance Act, 1953, the Corporation's liability to the levy in 1952 was £15,420.

Mr. S. H. Smith is chairman, issued capital is £2,105,085 divided into shares of 10s. each.

Mount Charlotte Sells Leases to Champagne Syndicate

Mount Charlotte (Kalgoorlie) Gold Mines Limited and Champagne Syndicate No Liability (a wholly-owned subsidiary of Western Mining Corporation Limited) have announced that the Mount Charlotte Company has sold its leases at the north end of the Kalgoorlie Goldfield to the Champagne Syndicate. The consideration for the sale will be an initial payment and annual instalments, the latter being related to the value of gold and other minerals obtained from the mine, profits from operations, and the ruling prices of gold and wage levels. The Champagne Syndicate further announce that it is unlikely that the property can be profitably worked whilst the current adverse economic conditions for gold mining continue.

Oil Returns in December

Lotitos Oilfields, whose production total for the year 1953 shows an increase of over 21,000 tons on that achieved in 1952, announced last week that it would recommend the payment of a final dividend of 15½ per cent, less tax, making a total distribution for the year of 23 per cent or double the total payments made in 1952. The company is also seeking Treasury consent to the capitalization of £2,000,000 of its revenue to make a free scrap issue of £1,000,000 5½ per cent First Mortgage Debenture Stock and a one-for-two free scrap issue of Ordinary Stock. At the same time the company is arranging that the Ordinary Stock be transferable in units of 5s. each.

Consolidated profits of the group, before tax, for the year 1953, are estimated at approximately £1,000,000.

Company	December (in tons)	Months Since Year End	Cumulative (in tons)	
			This year to date	Last year to date
Anglo Ecuadorian	26,995	9	236,219	221,869
Apex Trinidad	37,468	3	111,298	112,577
Attock Oil*	44,583	12	165,471	139,934
Kern Oilfields	27,716	7	193,718	180,616
Kuwait Oil†	3,360,835	11	38,620,002	34,067,141
Lobitos Oil	38,665	12	465,189	443,832
Trinidad Central	7,869	12	97,287	74,107
Trinidad Leaseholds	76,521	6	451,754	443,002
Trinidad Petroleum	39,721	5	197,129	208,354
Ultramar Oil†	112,079	12	1,190,759	1,315,799

Note: 1 ton taken to equal seven barrels. * December quarter.
† Figures are for month of November. ‡ Output figures are for SAP Las Mercedes in which Ultramar holds a 50 per cent interest

Mining Men and Matters

Sir Andrew Agnew has retired from the board of United British Oilfields of Trinidad.

Mr. B. H. Friel, who recently decided to live outside the Union of South Africa, has resigned his appointments as a director of Anglo American Corporation of South Africa and certain other associated companies, and also his appointment as a director of De Beers Consolidated Mines.

Mr. A. R. Neelands, chairman of the Cementation Company, sailed last week to South Africa on a business visit to the chairman and managing director of the South African subsidiary company, The Cementation Co. (Africa) (Pty.) Ltd., whose headquarters are at Johannesburg. It will be recalled that it was the Cementation Co. (Africa) (Proprietary) Ltd. which achieved so much success by the use of the Cementation process at No. 2 shaft, Free State Geduld Mine, in dealing with the heavy inrushes of water during the last quarter of 1952. Details of this important operation were described in *The Mining Journal* of January 23, 1953, under the title "Cementation Success in the O.F.S."

Mr. H. H. Richardson and **Mr. Dana T. Bartholomew** have been elected to the board of Aluminium Limited as vice-presidents of the company and **Dr. Earl Blough** and **Mr. George O. Morgan** have retired.

Holman Bros.: New London Office Address.—Messrs. Holman Bros. are moving on February 6 their London office from Broad Street House, where they have been for many years, to 44 Brook Street, London, W.1. Telephone: Hyde Park 9444. Telegraphic and cable address: Airdrill, London.

I.M.M. Travelling Fellowships, 1954.—A limited number of Travelling Fellowships will be offered by the Institution of Mining and Metallurgy to members of the teaching staff of universities and approved schools of mines and metallurgy in the United Kingdom, to enable them to visit important mining and metallurgical centres and research establishments in the 1954 long vacation. Applicants should be 30 years of age or over, and should be engaged in the teaching of mining engineering, extraction metallurgy, or economic geology. The tenure and value of each Fellowship will be decided according to individual requirements, but in general the tenure will not exceed three months and the value will not be greater than £500. The award is intended to meet the travelling expenses of the Fellow.

Forms of application for these Fellowships may be obtained from the Secretary, The Institution of Mining and Metallurgy, Salisbury House, Finsbury Circus, London, E.C.2, to whom they should be returned after completion by March 1, 1954.

Mond Nickel Fellowships, 1953.—The Mond Nickel Fellowships Committee has announced the three following awards for 1953: **Mr. J. E. Benson** (Metropolitan-Vickers Electrical, Manchester) to study the technique and interpretation of results of non-destructive testing of metal components in the United Kingdom, on the Continent and in the U.S.A. and Canada. **Mr. K. Blackburn** (Dorman, Long and Co., Redcar) to study hot-metal basic open-hearth practice in Great Britain, on the Continent and in the U.S.A. and Canada, with particular reference to mixer furnace operation, refractories, instrumentation and pit-side practice. **Mr. N. B. Pratt** (Broken Hill Proprietary, Newcastle, N.S.W.) to study the technical and economic aspects of recent advances in the erection and operation of integrated iron and steel works in Great Britain, the Continent, U.S.A. and Canada.

1,000,000 ACRES OF CANADIAN MINERAL RIGHTS IN ONE BLOCK

We would like financially responsible organization to join us for development. Preliminary exploration confirms widespread presence of many minerals in commercially indicated quantities including Uranium, Gold, Copper, Lead and Zinc. On Atlantic tidewater; labour, roads and power on property. Would also consider outright sale. Box 305, c/o A-J Advertising, 44 Old Bond Street, London, W.1.

THE SOUTH WEST AFRICA COMPANY

SIR DOUGAL MALCOLM'S SPEECH

The annual general meeting of The South West Africa Company, Ltd., was held on January 15 in London.

Sir Dougal Malcolm, K.C.M.G. (the chairman), in the course of his speech, said:—The profit on the year's working, before allowing for taxation, is £67,224. The balance carried forward from last year was £42,717, and we have also available surplus taxation provisions for prior years amounting to £11,343, making a total of £121,284, or £53,999 after allowing £67,285 for taxation on profit and distributions for the year. The main reason for an apparent taxation charge of 20s. in the £ on the profit as shown by the accounts is the difference between the depreciation provided in those accounts and the reduced allowances given by the Revenue authorities for income tax purposes, consequent upon legislation which drastically reduces allowances on additions to capital assets during the year covered by the company's accounts. It is proposed to pay a final dividend of 1s. 6d. per share, less income tax at 9s. in the £, which, together with the interim dividend of 6d. per share declared in June last, will absorb £29,249, leaving £24,750 to be carried forward.

Proceeds received from the sale of tin and wolfram during the year under review, when operations were still in the transition stage, waiting for completion of the plant, fell some way short of the expenditure required for the development of our Brandberg properties. To make matters even worse, our sales of vanadium products, though roughly double those of the preceding 12 months, did not reach the proportions which we had anticipated they would, and did not fully compensate for the reduced proceeds from the sale of lead and zinc.

As regards the current financial year which ends on June 30, 1954, I think I can say that our feeling is one of cautious optimism. While on the one hand the prices of lead and zinc remain at a low level when compared with the prices ruling during our peak year of 1951-2, on the other hand the production of lead-vanadium concentrates at Abenab West has increased substantially in recent months, thus reducing the cost per ton of concentrates to a considerable lower figure. As regards vanadium, however, sales unfortunately do not show signs of immediate improvement.

Progress of our operations on the tin and wolfram ore bodies in the Brandberg area in the west of the territory has been encouraging, and with the starting up of the new plant at Brandberg West a substantial increase in production has been effected, which is resulting in a reduction in the cost per ton of concentrates produced.

On the other hand, although the price of tin has remained fairly steady over the past few months, that of wolfram has continued to drop. However, economic exploitation is considered possible on the present scale of operations even at prices for these metals below those at which they now stand. Consideration is, however, being given to enlarging the scope of operations with a view to a reduction in production costs to meet such eventualities. By establishing a base at Swakopmund and a depot at Cape Cross, about 70 miles north of Swakopmund, and connected thereto by a good road, the use of Omaruru as a base is no longer necessary, and the transport of supplies to Brandberg West, as well as the movement of our tin and wolfram ores from mine to port, has been greatly facilitated by the elimination of the long rail journey from Walvis Bay to Omaruru, followed by the road journey of 160 miles to Brandberg West. Moreover, from our depot at Cape Cross we have been able to supervise operations for the production of salt from claims there which had been acquired by us at a very reasonable price.

Sales of salt in the year under review resulted in a small profit, and since the close of the financial year demand has further increased, both from the Union of South Africa and from the Walvis Bay fishing industry.

FURTHER WORKING CAPITAL REQUIRED

It has become clear that without the provision of further working capital the company will find it increasingly difficult not only to maintain its present scale of mining operations and to expand where such expansion would appear to be desirable but also to carry out the extensive prospecting operations called for in that area where lead, zinc, and vanadium occur, as well as on those tin-wolfram occurrences to which I have just referred and negotiations are in hand for the provision of further working capital with this object in view.

The report and accounts were adopted and the total dividend of 2s. per share was approved.

APEX (TRINIDAD) OILFIELDS LIMITED

The 34th Annual General Meeting of Apex (Trinidad) Oilfields Limited was held in London on Wednesday last.

Mr. Malcolm MacLachlan (Chairman), who presided, in the course of his speech, said:

The net profit for the year was £584,000.

The production for the year amounted to 2,986,000 barrels of crude oil and 4,058,000 gallons of casing head gasoline.

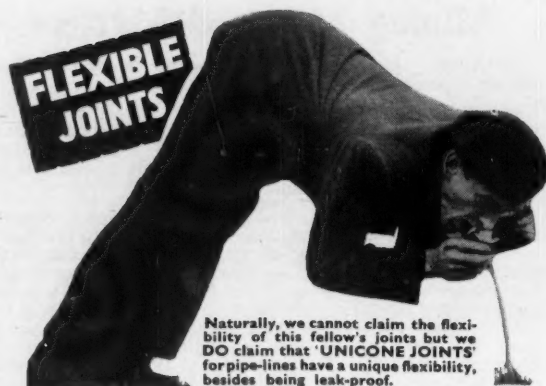
During the year 77,760 ft. had been drilled in continuance of the programme to obtain production and to extend the tested areas of the property. Five wells were completed in the Main Field and six in the South Quarry area.

In the main Synclinal zone three wells were completed, one small and two satisfactory producers. The deep well which was being drilled last year in the eastern part of the Syncline with the objective of testing whether the Herrera sands of the Penal oligocene structure extend under the Company's field was finally sunk to a depth of 14,889 ft., some 800 ft. deeper than the previous record for the Island. The well disclosed the presence of the Herrera sands at a depth of over 9,000 ft. but in this well the sands proved to be water bearing. A small sand in the upper cruse formation at somewhat over 5,000 ft. was giving small but so far steady oil production.

A further deep well was programmed to commence in the current year in the central section of the Syncline in addition to the deep well in the South Quarry area which was originally planned for last year.

The estimate given to members in 1944 of the total ultimate oil production from the then proven areas was proving conservative, and in addition the Company had a welcome contribution from the developments in the Synclinal zone. The Trinidad Management now estimated that, despite the production in the meantime of over 27,000,000 barrels, the further recoverable production should exceed the amount which was estimated to be available in 1944. While long experience of geological conditions in Trinidad had shown that estimates should be regarded with caution, it was satisfactory that the Company's reserve position showed some improvement. At the same time any considerable improvement would be dependent upon the outcome of the search for new oil reservoirs.

The report and accounts were adopted.



Naturally, we cannot claim the flexibility of this fellow's joints but we **DO** claim that 'UNICONE JOINTS' for pipe-lines have a unique flexibility, besides being leak-proof.

Represented in :—Scotland : Barnes & Bell, Ltd., 79 St. George's Place, Glasgow, C.2. South Wales : Tom Smith & Clarke, Ltd., New Cut Road, Swansea ; Belgium : Belgian Congo and Luxembourg : Pierre Schaepp, 2 rue des Sarts, Loversal, Belgium ; England : Hugh Wood & Co., Ltd., Team Valley Trading Estate, Gateshead-on-Tyne, 11 ; Hugh Wood & Co., Ltd., Industrial & Export Dept., Dashwood House, 69 Old Broad Street, London, E.C.2 ; Watts Hardy & Co., Ltd., Howdon Wagon Works, Howdon-on-Tyne ; Northern Ireland : E. H. McConnell Metals Ltd., 3-5 Dalton Street, Bridge End, Belfast ; Norway : Marstrand & Astrup A/S, Ingeniører, Sandvika Pr., Oslo ; U.S.A. : De Long Associates, Springhouse, Pennsylvania. Holland : P. Van Leeuwen Jr's Buizenhandel N.V., Zwijndrecht, (Holland), P.O. Box 1 ; Canada : Vulcan, Ford-Smith, Ltd., 925 Barton Street, East, Hamilton, Ontario.



THE UNICONE CO. LTD., RUTHERGLEN, GLASGOW, SCOTLAND

Banking with Barclays

Current, Deposit and other Accounts £1,389,108,838

A million pounds is by any standards a lot of money, and some whose daily business is not with figures find that anything more than a million is merely a confusion of numbers. But our Balance Sheet for 31st December shows well over thirteen hundred and eighty million pounds as the total of our customers' accounts with us. Many of these accounts are very large ones, many others very small, but in the aggregate they represent a volume of confidence of which we are proud ; and each individual account, large or small, has an equal claim upon our services, irrespective of its balance as expressed in pounds, shillings and pence.

BARCLAYS BANK LIMITED



JOHANNESBURG CONSOLIDATED INVESTMENT CO., LTD.

(Incorporated in the Union of South Africa)

MINING COMPANIES' REPORTS FOR QUARTER ENDED DECEMBER 31, 1953

GENERAL REMARKS—The revenue from gold has been calculated on the basis of gold at 248s. per ounce fine for October, 247s. 4d. for November, and 247s. 3d. for December, 1953.

In determining the payable development footage gold has been taken at 248s. 3d. per ounce fine.

The development figures mentioned below are the actual results of the sampling of development work on reef; no allowance has been made for modifications which may be necessary when computing the ore reserves. 10 and 11 Austin Friars, London, E.C.2. January 21, 1954.

THE EAST CHAMP D'OR GOLD MINING COMPANY LIMITED

(Incorporated in the Union of South Africa)

ISSUED CAPITAL.....£259,875

Crushed 67,000 tons; yielding 8,969 ounces fine gold

	£	Per ton crushed s. d.	Per oz. fine gold produced s. d.
Revenue from Gold	111,016	33 2	283 1
Working Costs	126,964	37 11	
	15,948	4 9	
Sundry Revenue	1,039		
Loss for Quarter	14,909		

Sums totalling £355 accrued during the quarter in respect of additional revenue from sales of gold at enhanced prices.

URANIUM PROJECT—Expenditure during the quarter in connection with the Uranium Project amounted to £82,127, making a total to date of £159,292; the Uranium Loan together with accrued interest totalled £177,924 at December 31, 1953.

Work on the Project is proceeding.

DEVELOPMENT—The DEVELOPMENT FOOTAGE sampled totalled 830 feet, and gave the following results: PAYABLE, 565 feet, having an average value of 6.9 dwt. over 28 inches. UNPAYABLE, 265 feet, having an average value of 2.1 dwt. over 27 inches.

ORE RESERVES—The ORE RESERVES at the end of the year were estimated to amount to 76,000 tons, with an average value of 3.4 dwt. over a stoping width of 51 inches.

GOVERNMENT GOLD MINING AREAS (MODDERFONTEIN)

(Incorporated in the Union of South Africa)

ISSUED CAPITAL.....£1,400,000

Crushed 749,000 tons; yielding 97,815 ounces fine gold

	£	Per ton crushed s. d.	Per oz. fine gold produced s. d.
Revenue from Gold	1,210,617	32 4	
Working Costs	1,129,982	30 2	231 0
	80,635	2 2	
Sundry Revenue	19,489		
Profit for Quarter	100,124		

In addition to the above, £4,153 accrued during the quarter in respect of additional revenue from sales of gold at enhanced prices.

The Government's share of profits for the quarter is estimated at £5,829.

PYRITE RECOVERY PLANT—Expenditure during the quarter in connection with the Pyrite Recovery Plant amounted to £149,402, making a total to date of £249,332, two-thirds of which sum will be met from Loan Funds. The erection of the Plant is proceeding.

DIVIDENDS—DIVIDEND No. 73 of 15 per cent (9d. per 5s. share) has been declared in Union of South Africa Currency, payable to shareholders registered at December 31, 1953.

DEVELOPMENT—The DEVELOPMENT FOOTAGE sampled totalled 5,555 feet, and gave the following results: PAYABLE, 2,730 feet, having an average value of 4.8 dwt. over 53 inches. UNPAYABLE, 2,825 feet, having an average value of 1.7 dwt. over 43 inches.

ORE RESERVES—The ORE RESERVES at the end of the year were estimated to amount to 7,024,000 tons, with an average value of 2.9 dwt. over a stoping width of 58 inches.

NEW STATE AREAS LIMITED

(Incorporated in the Union of South Africa)

ISSUED CAPITAL.....£1,514,037

Crushed 50,000 tons; yielding 9,415 ounces fine gold

	£	Per ton crushed s. d.	Per oz. fine gold produced s. d.
Revenue from Gold	116,521	46 7	
Working Costs	115,944	46 4	246 4
	577	3	
Sundry Revenue	2,848		
Profit for Quarter	3,425		

In addition to the above, £396 accrued during the quarter in respect of additional revenue from sales of gold at enhanced prices.

(NOTE: There was no liability in respect of Government's share of profits or taxation for the quarter.)

DIVIDEND No. 58 of 1½ per cent (3d. per £1 share) has been declared in Union of South Africa Currency, payable to shareholders registered at December 31, 1953.

THE DEVELOPMENT FOOTAGE sampled totalled 282 feet, all of which was unpayable, and which had an average value of 2.0 dwt. over 29 inches.

Except for the remnants of a few blocks, which will be mined out in the near future, no available ore reserve tonnage is left.

THE RANDFONTEIN ESTATES GOLD MINING COMPANY,

WITWATERSRAND, LIMITED

(Incorporated in the Union of South Africa)

ISSUED CAPITAL.....£4,063,553

Crushed 908,000 tons; yielding 116,130 ounces fine gold

	£	Per ton crushed s. d.	Per oz. fine gold produced s. d.
Revenue from Gold	1,437,281	31 8	
Working Costs	1,380,509	30 5	237 9
	56,772	1 3	
Sundry Revenue	19,077		
Profit for Quarter	75,849		

In addition to the above, £4,413 accrued during the quarter in respect of additional revenue from sales of gold at enhanced prices.

(NOTE: There was no liability in respect of taxation for the quarter.)

URANIUM PROJECT—At the Extraordinary General Meeting of Shareholders held on December 9, 1953, the borrowing powers of the Directors were increased to the amount of twice the Issued Capital of the Company for the time being in order to enable the Directors to raise further loans to meet expenditure in connection with the expansion of the Uranium Project.

Expenditure during the quarter in connection with the Uranium Project amounted to £1,056,280, making a total to date of £4,246,840; the Uranium Loan, together with accrued interest totalled £3,859,032 at December 31, 1953.

Work on the Project is proceeding.

DIVIDENDS—DIVIDEND No. 47 of 5 per cent (1s. per £1 share) has been declared in Union of South Africa Currency, payable to shareholders registered at December 31, 1953.

DEVELOPMENT—The DEVELOPMENT FOOTAGE sampled totalled 5,320 feet, and gave the following results: PAYABLE, 1,855 feet, having an average value of 6.8 dwt. over 35 inches. UNPAYABLE, 3,465 feet, having an average value of 2.1 dwt. over 36 inches.

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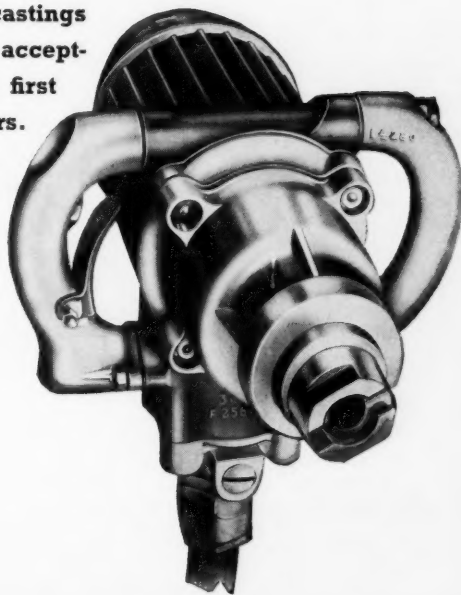


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